Introduction

Content

Introduction **1**

General 2
Documentation structure....3

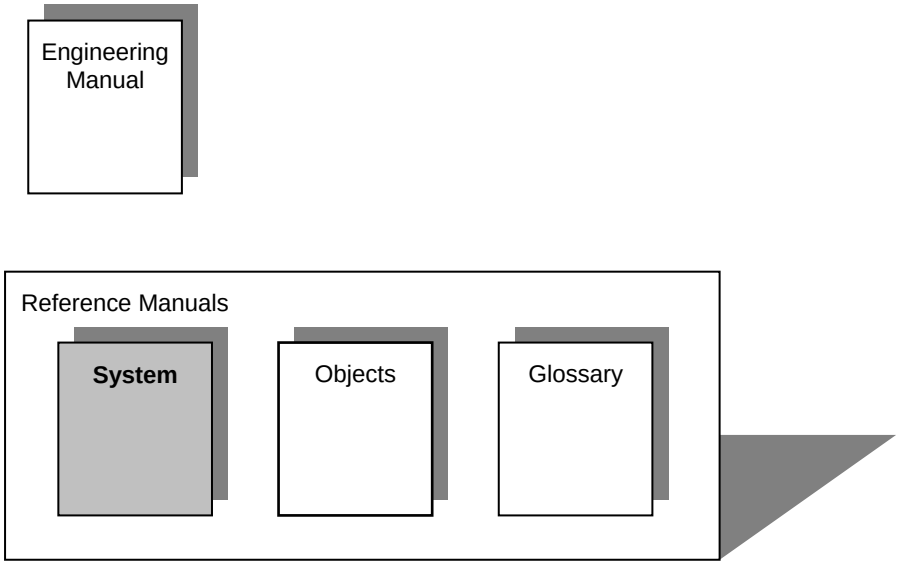
Copyright © Siemens AG. All Rights Reserved.

Ausgabe: 01.03.2005
D:\CEM_V6\DOCU\English\Reference\SYSTEM\01_Introduction.doc

General

You have here the *System Manual* for CEMAT V6. This manual is part of the *Reference Manual*. It should support you in performing the work required to configure your plant.

The *Reference Manual* is part of a comprehensive CEMAT V6 complete documentation. In the current version V6, this consists of the volumes listed below.



After the installation of CEMAT V6 the CEMAT documentation is available as PDL in directory D:\Cem_V6\Docu

On the following pages you will find the content of each manual.

Copyright © Siemens AG. Alle Rechte vorbehalten.

Documentation structure

The manuals contain the following chapters:

	Engineering Manual
1	Introduction
2	Preparations
3	Installation of a PCS 7 Project
4	Assignments
5	Engineering Examples
6	PLC Engineering
7	PLC-PLC Coupling to older CEMAT Versions
8	OS Engineering
9.	free
10	free
11	Project administration
12	free
13	Graphic Templates
14	Tips&Tricks
15	Update Information

	Reference - System
1	Introduction
2	
3	
4	System Description
5	
6	

Copyright © Siemens AG. All Rights Reserved.

	Reference - Objects
1	Introduction
2	General
3	Unidirectional Drive
4	Damper
5	Valve
6	Annunciation Module
7	UM-Module
8	Route Module
9.	Group Module
10	Selection
11	Silopilot
12	CNT-Module
13	RT-Module
14	PID Controller
15	Step Controller
16	Adapt
17	Measured Value Integrator
18	Bi-Directional Drive
19	Annunation Module with 8 Alarms
20	
21	
22	Adapt to Simocode
23	
24	
25	
26	
27	
28	Interlock
29	Interlock 5
30	

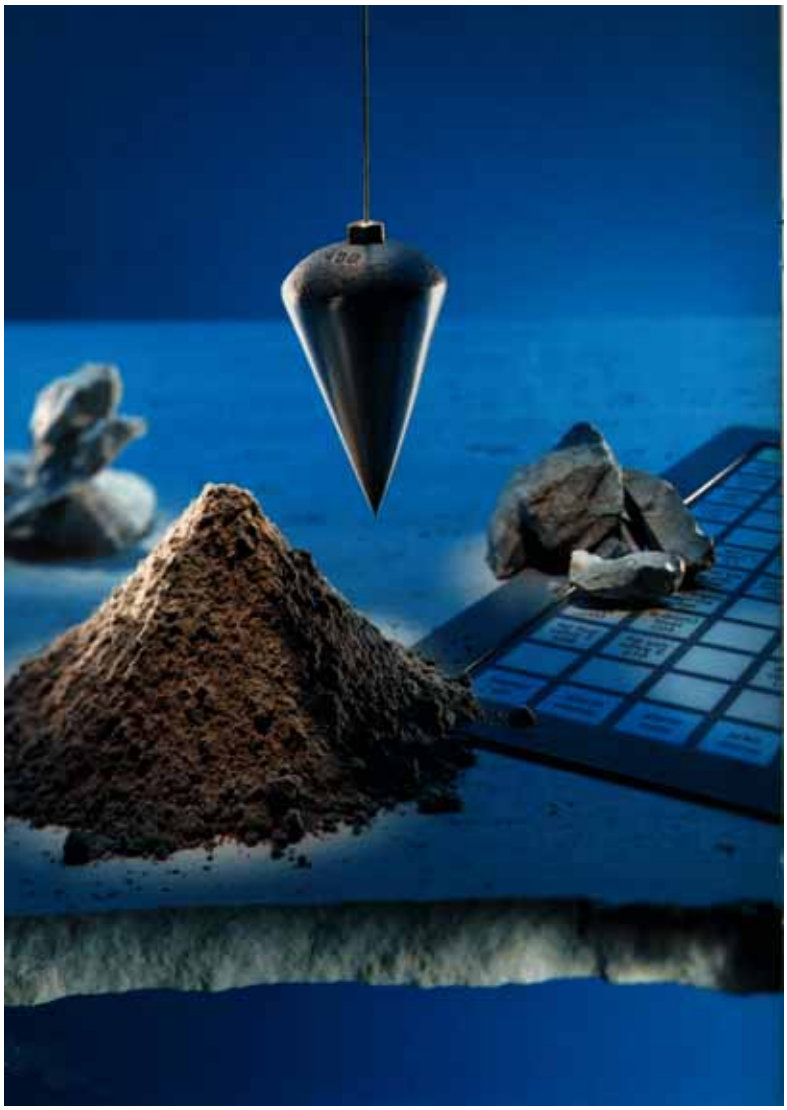
	Reference - Glossary
1	Introduction
2	Definitions and Instructions

Copyright © Siemens AG. Alle Rechte vorbehalten.

SIEMENS

Specification

CEMAT V6



A&D AS CC CCG

Table of Contents

CEMAT V6 i

General Description CEMAT 3

CEMAT modules ... 3
Introduction to the module description (AS) ... 5
General display rules (OS) ... 9
Representation types of the objects ... 12
Symbol ... 12
Faceplate ... 13
Diagnostic dialog ... 15
Parameter dialog ... 17
Operator control and monitoring with picture modules ... 18
Where does operator control take place? ... 18
Limit-value dialog - Operation ... 20
Parameter-table dialog - Operation ... 20
Group-state dialog - Operation ... 20
How are operator commands entered? ... 21
Who can operate? ... 22
Who can monitor? ... 22
Logging of operations ... 22
Message class ... 23
Infoserver - Description ... 24
Display ... 24
Operator Control ... 25
Message Line Functionality ... 27
Display ... 27
Operator Control ... 28
Extended Diagnosis with the Interlock Module ... 30
Display ... 30
Operator Control: ... 30
Specific Dialogs of the Group Module ... 31
Indication of the Group Status ... 31
Operation ... 31
Presentation of the Group instance list ... 32

Copyright © Siemens AG. All Rights Reserved.

Acknowledgement mode 33
AS-wide Acknowledgement (Default) 33
Group-wise Acknowledgement 33
Sequence Test 34
Start and Stop of the Sequence Test 34
Adapter Module for Non-CEMAT Modules 35
Display 35
Function 35
Multimedia Interfaces 36
Display 36
CEMAT Object Browser 38
Display 38
Configuring 39
CEMAT Message Dialog 40
Display 40
Operator Control 42
Configuring 44
Dialogs 45
Technical questions regarding the PCS 48
Device Functionality and Configuration Examples 57
Device Designations and Functions: 57
CEMAT Example configuration 61
System Configuration Technical Data 62
Bus Systems Technical Data 62
Process Stations Technical Data 67
Engineering Station Technical Data 69

General Description CEMAT

CEMAT modules

The library "ILS_CEM" contains all blocks which are required for a running CEMAT PLC. The Reference Manual Objects describe the functions of the CEMAT Object modules. All further Blocks are listed in the general documentation of PCS 7.

This chapter describes the general information about the CEMAT modules which is not specific for a certain object. You will find information about performance, an introduction to the module description (AS), general display rules (OS) and the representation forms of the objects.

In addition you will find operating instructions for the HMI.

Module data

FB/FC Number	Module (Type Name)	Comment from symbol list
FB1001	C_DRV_1D	Unidirectional drive
FB1002	C_DAMPER	Damper
FB1003	C_DRV_2D	Bidirectional Drive
FB1004	C_ANNUNC	Annunciation
FB1005	C_ANNUN8	8 Annunciation
FB1006	C_MEASUR	Measured value
FB1007	C_VALVE	Valve
FB1009	C_ROUTE	Route
FB1010	C_GROUP	Group
FB1011	C_SILOP	Silopilot
FB1013	C_SELECT	Selection
FB1015	C_COUNT	Counter
FB1016	C_RUNNT	Run time
FB1020	C_FB_PLC	AS object
FB1026	C_MEAS_I	Integrator
FB1031	C_DRV_SIMO_2D	Einrichtungsantrieb SIMOCODE
FB1032	C_DAMP_SIMO	Klappe SIMOCODE
FC528	OB1_SYS2	ILS OB1 end
FC529	OB35_SYS1	ILS OB35 start
FC530	OB35_SYS2	ILS OB35 end
FC1001	C_SPEEDM	Software speed monitor
FC1011	C_SPCNT	Pulse acquisition silopilot
FC1017	C_MUX	Multiplexer group/route

 Copyright © Siemens AG. All Rights Reserved.

FC1088	C_PUSHBT	Console keys
FC1102	OB1_SYS1	ILS OB1 start
FC1103	C_OB1SY1	CEMAT OB1 start

CAUTION: The modules specified in the table require the following FB,FC and DB:

DB678-DB682 FB50, FB1030 FC509 to FC530 and FC1061, FC1062

** not relevant

Cycle-time measurements for sample configuration:

Group	Route	Selection	Motor	Damper	Valve	Annun	Cont..	Meas. value	Cycl. S7	Compil. min.	Load min.	Map. min
10	8	30	100	20	50	0	0	100	**34**	2,5	2	7
10	8	30	150	20	50	0	0	200	**46**			

Copyright © Siemens AG. All Rights Reserved.

Introduction to the module description (AS)

The module descriptions always have the same form. This helps you to find the required information quickly when you read the description of the individual module.
Here is a description of the sections:

Module name: Unique name of the S7 Block, e. g. C_DRV_1D
For the CEMAT Objects this corresponds to the name of the object type.

Type/number

The listed blocks have to be called if you want to use the object. The blocks are listed with name and number.

Module no.: Unique number of the function block (FB) or function (FC)

Calling OBs

This provides details of the organizational blocks (OBs) in which the described block must be installed.

In contrast to the general PCS 7 libraries the CEMAT library has some specialties. Most of the CEMAT blocks must be called exclusively in the OB1 task. Exceptions to this are the counter and the pulse evaluation of the software speed monitor and and the silo pilot. These blocks can be called in a time interrupt OB. Detailed information is available in the object descriptions.

Some blocks of the system chart have to be called in more than one task, e.g. the system part of the PLC-PLC coupling. If you copy the complete system chart from the delivered library into the S7 program of your project, the blocks are automatically called in the right tasks.

When you install the modules in the CFC they are automatically called after the most recently installed module. If necessary, you must change the processing sequence with the run-time editor. The CFC creates the necessary OBs during the compilation.

Function

This contains a summary of the function of the module. The section operating principle contains further information for complex modules.

Operating principle

This contains more detailed information on the function of individual inputs, operating modes, time processes, etc. You should understand the interrelationships described here in order to use the module effectively.

Copyright © Siemens AG. All Rights Reserved.

Error handling

The error display is located in the CFC plan at the ENO Boolean module exit. The value corresponds to the **BIE** (binary result in STEP 7-STL on completion of the module) or the OK bit (in SCL notation) and means:

ENO=BIE=OK=1 (TRUE) -> the module result is correct.

ENO=BIE=OK=0 (FALSE) -> the result or the general conditions for this calculation (e.g. entry values, operating mode, etc.) are invalid.

Start-up charactristics

A differentiation is made between:

First run
The module is called initially from the OB in which it has been inserted. This is usually the OB in which the normal, process-related processing takes place (e.g. OB1). The module is preset with the status corresponding to the input parameters. These can be default values (also refer to I/O bar) or previously configured values, which, for example, you have parameterized in the CFC. No special start-up behavior is described unless the module deviates from this rule.

Start-up
The module is processed once during a CPU start-up. To ensure this, the module has to be called from a start-up OB (where it is included automatically by the ES). The start-up behavior is described in this case.

The CEMAT object modules don't have start-up characteristics. The blocks are called exclusivly in the cyclical program.

Time characteristics

A module with time characteristics must be installed in a cyclic interrupt OB. It calculates its time constants/parameters using its sampling time (the time interval between two successive, cyclical processing steps). The sampling is determined by the step downs for the so-called run-time group. This ensures that the module is not processed for every OB passage. This sampling time is entered in the I/O bar, in the SAMPLE_T parameter.

The time behavior is mentioned only when the module exhibits such behavior.

The CEMAT object modules don't have time characteristics. However for some of the objects the run sequence is important. This is described under time characteristics.

Annunciation characteristics

The module with this behavior reports various events to the higher-level OS. When present, the parameters needed to create the annunciation are documented. Modules without annunciation behavior can be augmented with additional annunciation modules. The description for modules with annunciation capability contain an indication of the annunciation behavior.

Module states

The status of the CEMAT Objects is shown in the symbol through change of the bitmap or change of the color and in the faceplate through a short info text. The presentation of the visualization status is shown under module status.

Commands

The possible commands for the object are listed in the OS variables table.

Copyright © Siemens AG. All Rights Reserved.

I/O bar of ...

The I/O bar provides the data interface for the module. You can use this to pass data to the module and to fetch results from the module.

Element	Meaning	Format	Default	Type	Attr.	HMI	Permitted Values
U1	**Summand 1**	**REAL**	**0**	**I**	**Q**	**+**	**>0**

The "I/O-bar" table shows all input and output parameters of the module type which the user can access with his configuring means. Those elements that can be reached only from the module algorithm are not listed (so-called internal variables). The columns have the following meaning:

Element
Name of the parameter, derived from the designation, e.g. PV_IN = Process Variable INput (process quantity, control quantity). Where appropriate, the same name convention as for SIMATIC is used.

Meaning
Function (possibly short description)

Format
S7 data type of the parameter (BOOL, REAL, etc.).

Default
The value of the parameter before the module runs for the first time (provided it has not been changed during the configuring).

Type
Type of the module algorithm access to the parameter; a differentiation is made between inputs, non-isolated inputs and outputs (refer to table).

Parameter Types:

Abbreviation	Type
I	Input. Value supplied to the module (display in the CFC: left-hand parameter list)
O	Output. Output value (display in the CFC: right-hand parameter list)
IO	Input/Output. Non-isolated input, which can be written from the OS and rewritten from the module (display in the CFC: left-hand parameter list)

Attr. (Attribute)
Additional characteristics of the parameter when used under CFC. Non-connected input and input-output parameters can be parameterized (only input-output parameters for online FCs). Output parameters cannot be parameterized and can be transferred in the CFC by connecting to an input of the same data type. Additional or deviating properties of the parameter are specified as follows:

Attributes of the parameters:

Abbreviation	Attribute
B	Can be operated (only using the OS). An OS can make write access to the element. It is implicitly not visible in the CFC.
E	Transferred to the OS when changed
M	MESSAGE ID not parameterizable for annunciation module (e.g. ALARM 8P). ID specified from the annunciation server.
Q	Connectable. The element can be connected with another output of the same type.
U	Not visible in the CFC. Because the element is supplied by the CFC or the OS, it is not displayed in the CFC (e.g. message ID). It is a default value that can be changed in the CFC.

Copyright © Siemens AG. All Rights Reserved.

HMI
The parameters marked with "+" can be changed and monitored from the associated OS module.

Permitted values
Additional limitation within the data type value range.

OS variables table

In the OS variables table the detail information for all HMI variables is llisted for the object type. These variables are used to exchange information between AS and OS.

The following information can be seen in the table

S7 Parameter Name
Parameter name used in the S7 program (internal information)

Assignment
Symbolic name of the parameter used in the CFG-File (internal information)

OS Variable No.
Variable number used in the CFG-File (internal information)

Designation German
Description text of the parameter in german

Designation English
Description text of the parameter in english

Output level
Where is the information shown in the OS
S = in the Symbol
O = in the Faceplate
D = in the Diagnostic dialog

Presentation Number/NK
Number of Digits for representation on the OS

Unit
Unit of the value

Type
Parameter type
I = Input
O = Output
I/O = In/Out

Value range
Value can be entered between this range

Annunciation Class
Message class, e. g. ALF = PLC Control System Annunciation

Fault Class
Classification according to the origin of the fault
E = Electrical
S = Safety
M = Mechanical
P = Process

Event Text
Text which is displayed in the alarm line

Copyright © Siemens AG. All Rights Reserved.

General display rules (OS)

Prerequisites

PCS7 must be installed in order to use faceplates. The base data wizards from PCS7 must also be executed. The Splitscreen Manager must have been configured.

Text and color layout

Text

The **Arial** font is used as standard. The following classes are available:

Class	Type size	Character font
Output	10	Bold
Input / Keys	10	Normal
Labelling (frame)	8	Normal

The colors are specified as follows.

Fields

Color Class	Type	Background	Character / Frame
Input	Frame	White	Black
Output	Frame	Gray	Black
Keys	3D	Gray	Black

Bars and Annunciations

Color Class	Symbol	Character / Frame
Actual value	Green	White
Setpoint	White	Black
Control output	Cyan	Black
Alarm	Red	White
Warning	Yellow	Black
System fault	Black	Yellow
Operation call, substitute value	Blue	White

Copyright © Siemens AG. All Rights Reserved.

Switching states

Color Class	Symbol	Character / Frame
Off	Gray	Black
Error	Red	White
Not Ready	Violet	White
Ready	Light blue	Black
On	Blue	White
Switching	Yellow	Black
Running	Green	Black
Local mode	Yellow	Black
Single mode	Cyan	Black

Operational states

Color Class	Symbol	Character / Frame
Automatic	White	Black
Manual	White	Black
Single mode	Cyan	Black
Local mode	Yellow	Black
Unlocked mode	Orange	Black

Number format

The number formats are formed automatically using limit values and number type. The display with comma or decimal point depends on the language. (German = comma, English = point)

Limit value for the number	Number format
Absolute value >= 0.1 to <10	+/-1.2345
Absolute value >= 10 to <100	+/-12.345
Absolute value >= 100 to <1000	+/-123.45
Absolute value >= 1000 to <10000	+/-1234.5
Absolute value >= 10000 to < 1000000	+/-12345
All other cases	+/-1234e+/-12

Copyright © Siemens AG. All Rights Reserved.

Analog value representation

The analog values are displayed as floating-point values as follows:

values:	max. five digits, sign and decimal point
overflow	"*****"
leading zeros:	are suppressed
invalid values:	gray (e.g. for AS failure)
decimal point:	can be defined using the property setting
status colors :	the background color of the output field is changed depending on the status value. (alarm, warning, life zero, service)

Operator authorization

The operator authorizations are specified for each operator control. The following authorizations are provided:

Monitoring	PCS7 level 4 is needed for: invocation of the faceplate
Process operator control	PCS7 level 5 is needed for: manual operation changing the operating mode changes to setpoints
High process operator control	002 Authorization for area 006 Higher process controlling 007 Report system 008 Archive controlling 018 Modify warning limits 019 Modify alarm limits 020 Modify switching limits 021 Controller parameters 022 Object parameters 023 System operations 024 Interlocking signals 025 Enter recipe data 026 Read recipe data 027 Write Service data

The PCS7 can be used to specify these operator authorizations for each area. This means that the picture hierarchy also affects the operator authorizations . Every user can be given different operator authorizations for each area. Operator groups can also be formed.

Copyright © Siemens AG. All Rights Reserved.

Representation types of the objects

The picture modules have various representation types. The user can choose between the following views:

Symbol

Faceplate

Secondary dialogs (diagnosis, information)

Symbol

The symbol is the simplified view of the associated AS module. The symbol can contain the following information in accordance with the representation type:

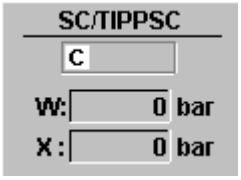
Plant identification (TAG)
Symbolic status display of the AS module
Setpoint, actual value
Limits
Annunciation / operating status display

The following diagram illustrates the symbol of a picture module.

Representation types:

Bitmap

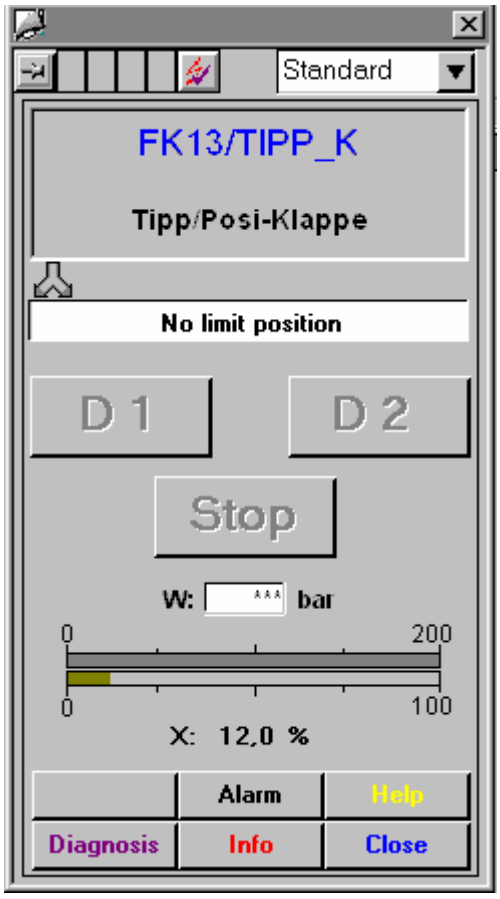
Dialog Sollwert / Istwert



Copyright © Siemens AG. All Rights Reserved.

Faceplate

The faceplate provides a detailed view of the associated AS module.
The following diagram illustrates the faceplate for a damper.



The faceplate has the following structure:

Heading lines: The heading line contains the plant identification and the associated comment for the AS module.

Object description: TAG and the matching comment of the AS module are indicated
The comment line is double spaced and has after 24C a line layout if no shining from the 19th sign follows. Please follow this formatting already with the comment input in the CFC

.

Module state announcement:

Row consists of the symbolic announcement, test mode, simulation, bad Quality

Module status display: This shows in plain text, -language depended-, the status of the AS module assigned to the picture module.

Object function operator commands:

Use for direct process control

Depending on the module states and authorizations,
the operator control elements are activated for the user.

Invocation buttons for secondary dialog :

Copyright © Siemens AG. All Rights Reserved.

Six buttons can be used to specify different secondary dialogs or commands in conjunction with the object.
The secondary dialogs can contain the following items depending on the type:

Diagnosis	Display AS module diagnosis
Info	Object-related information (only with ODI AddOn)
Limit value	Display and setting of the limits for measured values and setpoints
Parameter	Parameter settings such as GAIN, TV, TN, etc.
Trend	Display of the WinCC curve window
Alarm	Display of the WinCC message window
Maintenance	Information and parameter settings for maintenance personnel

The individual secondary dialogs are always visualized together with the faceplate.

Copyright © Siemens AG. All Rights Reserved.

Diagnostic dialog

The diagnostic dialog has the following structure:

Heading lines: The heading line contains the plant identification and the associated comment for the AS module.

Interface word display:

This displays the interface status of the AS module assigned to the picture module.

Input signal states

These are indicated using colored circles.
Signal state: "0" = gray
"1" = green
To indicate the preferred signal states always needed to start an object, these interfaces are listed in "green" with a "dark gray background".
If a blue ring is visible before the input signal, a Interlock-Faceplate can be called for this signal .

Process parameter operator control:

Process parameter output values are displayed with black lettering on a gray background; process parameter input values are displayed as a white, inset box with the value shown black.

Parameter field: This displays the hardware signal states of the object.

Operating time acquisition:

Depending on the object type, the running times are displayed in hours or as the number of operations.

A pushbutton can be used to reset this display; this reset time is also visualized.

Module outputs:

The output signals important for diagnostic evaluation are displayed together with their status.

Releases:

Depending on the object type, function or annunciation releases are visualized.

Faults:

Colored squares indicate faults.

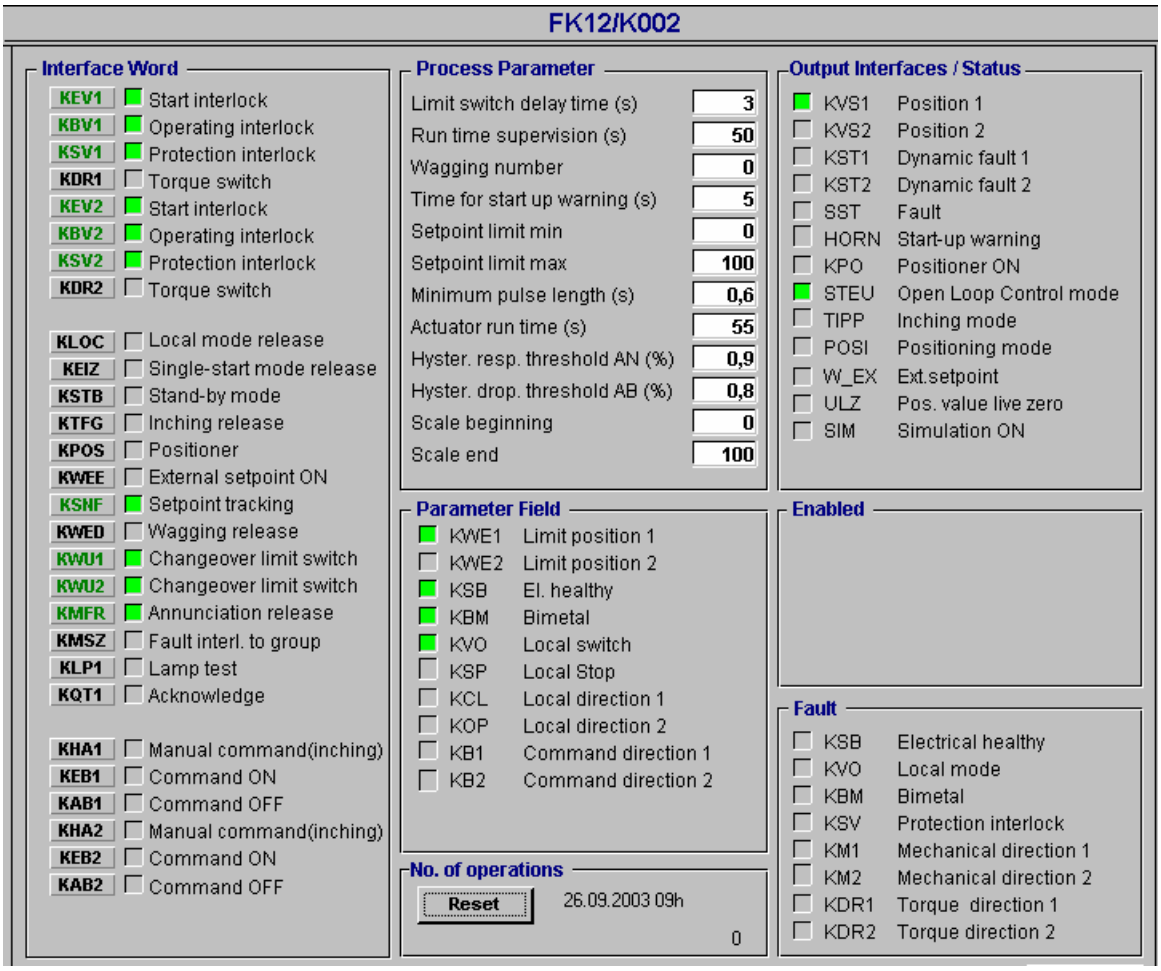
Signal status	"0" = gray	(no fault)
	"1" = red	(fault)

Object function operator control:

Invocation keys for input-output assignment, service manual, help dialog, printing window permit the invocation of secondary applications that display detailed information on this particular object.
("Diagnostic" AddOn needed)

Copyright © Siemens AG. All Rights Reserved.

Display example:



Damper diagnostic dialog

Copyright © Siemens AG. All Rights Reserved.

Parameter dialog

The parameter dialog has the following structure:

Heading lines:

The heading line contains the plant identification and the associated comment for the AS module.

Process parameters:

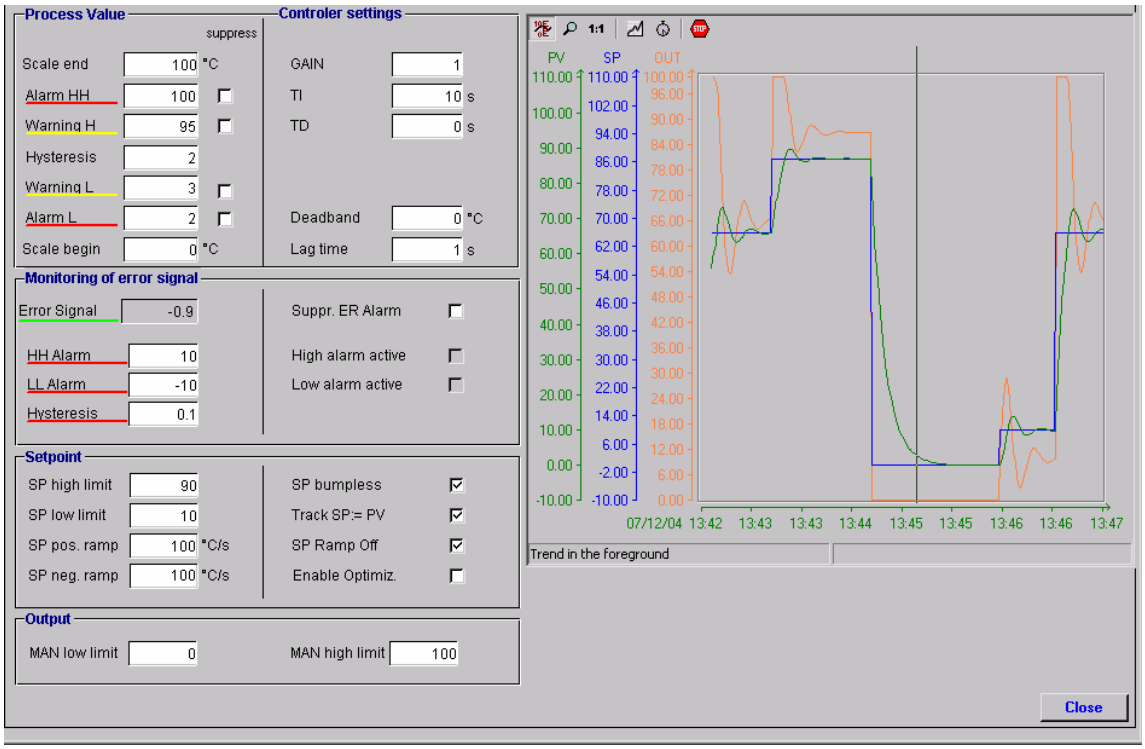
This dialog is used to set the controller parameters.
A yellow frame shows the currently active PID parameter set.

Curve window:

A curve window displays the setpoint, actual value, and the manipulated quantity.

The **Ruler** button displays a ruler and the associated display of the values for W,X,Y at this ruler position.

Sample display: Controller



Controller parameter table

Copyright © Siemens AG. All Rights Reserved.

Operator control and monitoring with picture modules

Where does operator control take place?

Operatable objects are shown with cursor presentation-change, if these surfaces are contacted by the cursor.
Thereby object symbols, value-presentation-fields or complete dialogs serve for dot sensitive surfaces.

Furthermore after a short cursor dwell time over the object, the tool tip text is displayed.

Symbol operation:

If there are buttons or input fields in the object, the specific programmed functions are executed with a singleclick on these elements
The faceplates (input fields) are displayed there as panels with a white background. The panels with a gray background are display-only panels and cannot be changed.

By clicking the different mouse buttons on any object you can trigger the following functions.

Left mouse button		
Single click	On a symbol	Open faceplate
	On a jogging button	Change value by one decade
	On a value panel	A bar cursor indicates readiness for input or (value shown in red during the change) an input dialog is opened
Double click	On a jogging button	Change value by a tens decade
	Press and move	Change value using slider The limits for changing the setpoint are displayed left and right above the slider button
Middle mouse button		
Single click		No function
Right mouse button		
Single click		Open the object help window or, if available, the property box

Operator control windows or info-boxes must always be closed by the operator
(no automatic closing after command triggering).

Note : All tool tips of an object type (e.g., drives) can be made visible in a picture, with an addition projected key

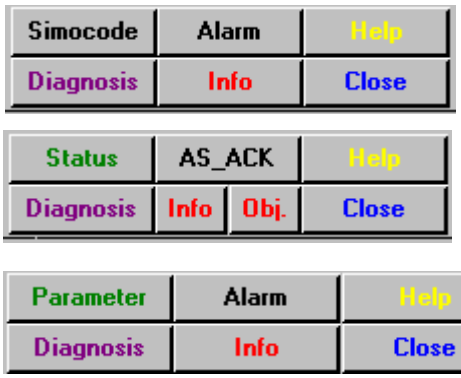
Copyright © Siemens AG. All Rights Reserved.

Faceplate operation:

In a faceplate, only object-specific operations which are necessary for the process control are possible.

Left mouse button		
Single click	On a button	A continuation dialog is opened or a command is sent to the PLC
	On a jogging button	Change value by one decade
	On a value panel	A bar cursor indicates readiness for input or (value shown in red during the change) an input dialog is opened
Double click	On a jogging button	Change value by a tens decade
	Press and move	Change value using the slider until the setpoint limits are reached

What is concealed behind the dialog buttons?



Analog	Call up the measuring dialog of the drive
Simocode	Call up the SIMOCODE dialog of the drive
Status	Presentation of the Group state list
Alarm	Call up the alarm dialoge with operation and process alarms
AS_Quit.	Acknowledge the complete AS
Help:	Operation description to the object
Diagnosis:	Presentation of PLC data like process parameters and states
Info	Presentation of local labels, annunciation-system information, user info-texts
Obj.:	Presentation of the Group instance list
Parameter:	Controller parameter dialog
Close:	Close the dialog box

Copyright © Siemens AG. All Rights Reserved.

Diagnosis dialog - Operations

Only process-parameter inputs and button operations are possible in this dialog.

Left mouse button		
Single click	On a button	A continuation dialog is opened or a command is sent to the PLC
	On a value field	A bar cursor indicates readiness for input or (value shown in red during the change) an input dialog is opened

Limit-value dialog - Operation

See diagnosis dialog

Parameter-table dialog - Operation

See diagnosis dialog

Group-state dialog - Operation

No additional operations other than "Close".

Copyright © Siemens AG. All Rights Reserved.

How are operator commands entered?

To avoid incorrect operation to the largest possible extent, the operator must always confirm process commands and parameter changes (two-level operation). The entered value is written to the corresponding entry of the AS module only when this confirmation has been made (exception: jogging operation).

How are numeric input fields used?

Enter the new value into the operatable field, or click on the Up/Down buttons.

The "old value" always appears for a value input field.
"Return" must be used to terminate the "new value input".

Press the "ESC" key to cancel a "new value input".

Result: The software checks the plausibility of the entered value. If the limits are undershot or exceeded, a warning box is output or the input value is displayed flashing together with the violated limit. The value is the written in the AS module when it lies within the limits. If a bar display is provided, this adapts itself to the newly selected value.

Value changes are subject to a specific operator authorization level and can be performed only when the operator possesses this right. This ensures that only a certain operator group can perform these parameter changes, if required.

The operator authorization is not automatically revoked.

How are jogging keys used?

In jogging operation, click on the provided keys. The value changed by the corresponding delta values is then written into the AS module without confirmation.

Special processing:	"single click" represents a change to the value by "a decade" of the value "double click" represents a change to the value by "a tens decade" of the value.

The value can be changed only as far as the limit value; it is not possible to enter a value that lies outside these limits.

The authorization prompt is also active here.

How is the slider used?

When a value is changed using the slider, the "new value" is always shown in the associated input field. The numeric values appear in red.
Coarse positioning is performed by selecting the slider button with the cursor and moving the slider button while keeping the left mouse button pressed. A single click on the arrow keys on the left and right side of the slider can be used to make a fine adjustment to the input value.
The input value is limited by the lower and upper setpoint limits, which appear over the arrow keys.
"Return" must be used to terminate the "new value input".

How is the user's note given?

put the cursors on the user note field and "easy click".
Text give with line layout at the end of the row.
After occurred text input store them by "easy click" on the " floppy disks key “ (1.from the left).

Copyright © Siemens AG. All Rights Reserved.

Which hot keys are used?

In all online dialogs an object type specific help can be called with F1 and the dialog will be closed with ESC.

Who can operate?

The operation of process values and changes to parameters is possible only with specific user authorization. The authorization levels are assigned during the login of the associated user and specified in WinCC.

The picture modules use parameter-dependent authorization levels, in particular:

002 Authorization for the Area
004 Monitoring
005 Process operator control

018 Modify warning limits
019 Modify alarm limits
020 Modify switching limits
021 Controller parameters
022 Object parameters
023 System operations
024 Interlocking signals
025 Enter recipe data
026 Read recipe data
027 Infodialog valueinput
028 Infodialog Service parameterisation

The assignment of the authorization levels is described for the individual picture modules.

Who can monitor?

When an operator has control authorization for a plant section, he can monitor all picture modules present in this plant section.

Logging of operations

The WinCC annunciation system records every process operation/parameterization. The following values are passed to the annunciation system:

Time of the operation (date, time)
Message type
Incoming message
Parameter name
Old value
New value
Batch designation
Plant identification
Area
Batch name
Command text
Name of the logged in operator
Unit

Copyright © Siemens AG. All Rights Reserved.

Message class

Assignment of messages according to their cause. The SIMATIC process control system uses the following message classes:

Process messages that are initiated when process-specific monitoring values are reached or violated (e.g. alarm, warning, upper/lower tolerance, general process messages).

Control system messages issued by the control system (system messages), by the peripherals (fault in the field) or for preventative maintenance.

Operator control messages that warn the operator that he needs to intervene for certain processes (e.g. operator control to confirm a manual step control to continue) or operator control logs.

The table shows the possible message classes and their meaning

Message class	**Meaning**
AH	High High Alarm
WH	High Alarm
WL	Low Alarm
AL	Low Low Alarm
TH	Tolerance High
TL	Tolerance Low
F	Process Fault (Field)
S	Control System Message (System)
ALF	PLC Control System Fault
M	Preventitive Maintenance (Maintenance)
PM	Process Message
OR	Operator Request
OM	Operation Message

Copyright © Siemens AG. All Rights Reserved.

Infoserver - Description

Display

Information Dialog

The information dialog is organized as follows:

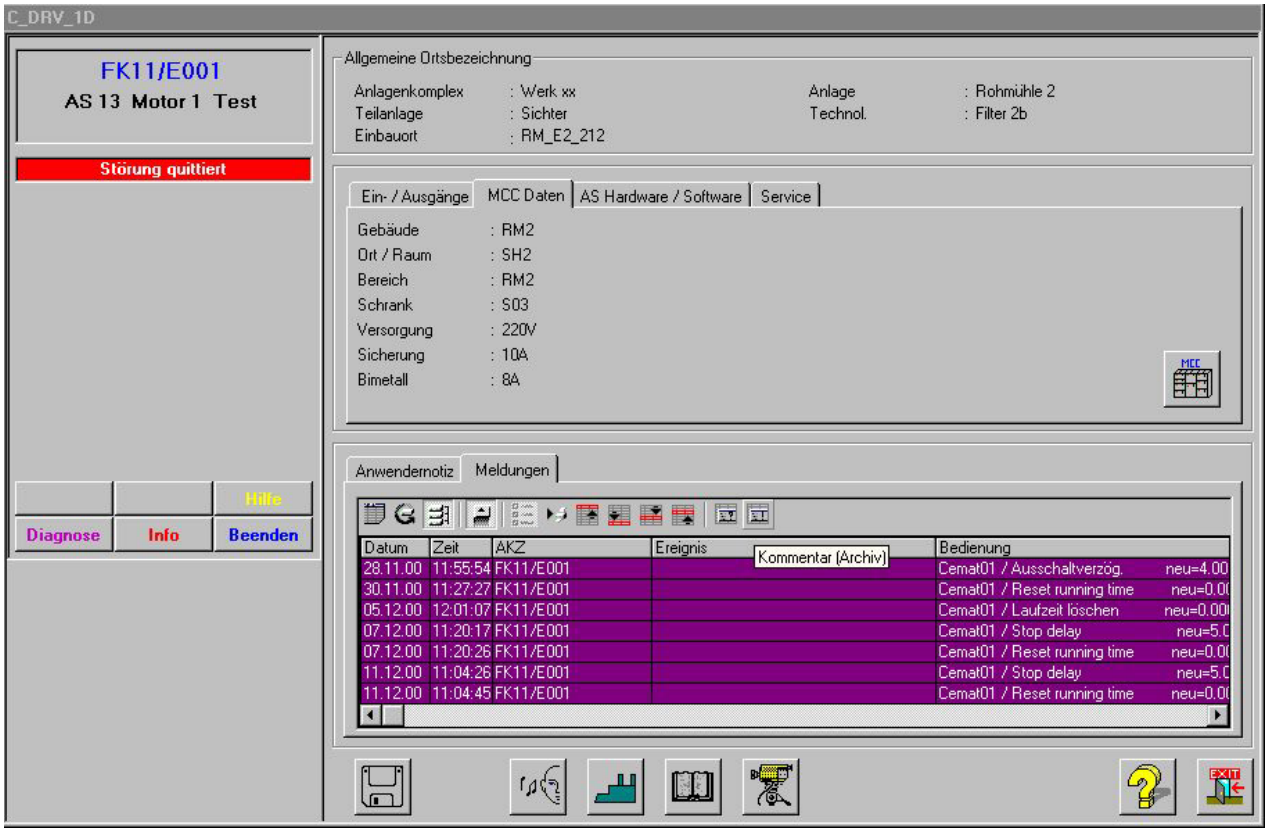
Header lines: The header lines display the general location designations and the installation location of the object with the plant structure.

Registers: They contain standard information about
- Input/output descriptions with overview plan key
- MCC descriptions with overview plan key
- AS hardware and software modules with overview plan key
- Service inputs for Loop in Alarm, etc.

User notes: The user is also given the capability to store his own information text.

Message output: The object-related messages are output in a message window.

Sample display:



Drive set-up information dialog

Copyright © Siemens AG. All Rights Reserved.

Operator Control

This dialog provides the control room operator only with information text input and key operations.

Given special operator authorization, additional definitions can be entered in the "Service" register.

Click on a register to display its parameters in the foreground.

Left mouse button		
Single click	on a key	To open a secondary dialog or switch a register, or to execute message line functions
	on the notes field	A bar cursor indicates readiness for input
Center mouse button		
Single click		No function
Right mouse button		
Single click		No function

What do the secondary dialog keys initiate?

The keys are assigned to icons, the descriptions follow from left to right.

Diskette:	Save the user notes and service entries (no secondary dialog)
Sound input/output:	Dialog with sound recording and replay mechanisms (USER)
Location plan:	Display of the exact position of the object in the works (USER)
Service manual:	Descriptions for trouble-shooting for this object (USER)
Video guide:	Video description for trouble-shooting (USER)
Circuit diagram:	Circuit diagram of the object (not displayed)
Function plan:	Locking logic for this object (not displayed)
Help:	Description of the contents and the operation of this dialog
Exit:	Close this dialog.

Each register contains a key that can call the hardware drawings on this topic.

Input/output assignment:	Assignment of the input/output cards (cabinet assignment)
MCC field:	Assignment of the MCC cabinet (cabinet assignment)
AS hardware:	Construction of the cabinet in which the AS is installed which this object belongs to (cabinet assignment).

How are the user notes entered?

– Place the cursor on the user notes field and "single click".
– Enter the text with line-feed + Ctrl at the end of the line.

Once the text has been entered, "single click" on the "Diskette key“ (1st on the left) to save.

Copyright © Siemens AG. All Rights Reserved.

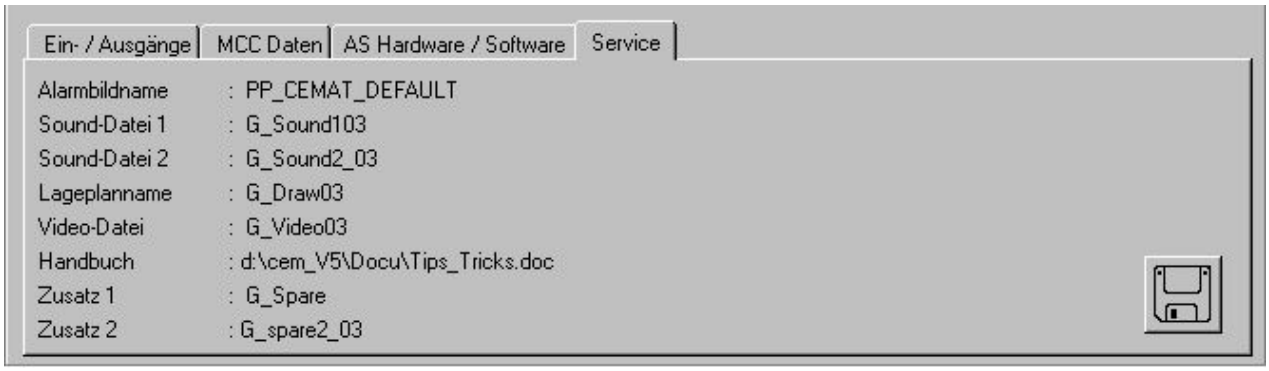
Which operations are available in the message window?

The functions of the 12 icons that appear in the message window command line are listed below:

1. Select message lists
2. Select short-term archive
3. Select long-term archive
4. Scrolling on/off
5. Specify selections
6. Output log
7. Go to the start of the message list
8. Go to the end of the message list
9. Select the next message line below
10. Select the next message line above
11. Information text for the selected message line
12. Comment for the selected message line.

In the "Scrolling OFF" state, the horizontal scrollbars (below the messages) can be used to display additional message line information.

Which inputs are possible in the Service register?



1. Loop in Alarm picture name that is invoked from the alarm line.
2. Special sound information file 1, USER application multimedia, e.g. sound output
3. Special sound information file 2, USER application multimedia, e.g. sound output for text files
4. Location plan coordinates, USER application multimedia, e.g. position of the object in the works
5. Video file designations, USER application multimedia, e.g. maintenance guides
6. User manual, USER application multimedia, e.g. starting guides for the group...
7. Spare
8. Spare

Copyright © Siemens AG. All Rights Reserved.

Message Line Functionality

Display

Message line functions

A message line can contain the following information (from left to right):

Incoming date/time of the message
Plant identifier
Fault type
Message text
Fault class. (P = process, E = electrical, M = mechanical, S = safety (emergency off))

The message line displays only **non-acknowledged** messages from the selected plant sections.

A newly arrived message
- Always appears immediately in the message line (even when operations are being performed on the previously displayed message).
- Produces an acoustical signal that continues until it is reset by clicking an acknowledge key.

If several messages arrive quickly in succession, the acoustical signal for the latest message is output.

The acoustical signal can be activated/deactivated in a parameterization box.

Color attributes

The messages are displayed in the following colors depending on the message class and message state:

	Alarm	Warning	Sys
Message arrived	white / red	black / yellow	white / violet
Message gone	white / light green	white / light green	black / light green

Copyright © Siemens AG. All Rights Reserved.

Operator Control

The three additional keys placed at the right of the message line initiate the following functions:

key L	- *left mouse button* (SC)	- Invoke alarm picture (Loop in Alarm). This is the process picture in which the faulty object is displayed.
key I	- *left mouse button* (SC) - *right mouse button* (SC)	Invoke faceplate dialog for the object. show the CEMAT version dialog
	- *left mouse button* (SC)	Alarmdialog open
	- *left mouse button* (SC)	Acknowledge pending messages until the message line is empty. When a message is acknowledged, the next non-acknowledged messages move up and an acknowledge telegram is sent to the automation unit from which the message came.

Area selections for the alarm line

ATTENTION NEW!!!

The messages are signalized in dependence of the operating authorization **"process service"** of the actually logged in user.

Loop in alarm Call

Change in the defined process picture in him the disturbed object is indicated.

The " Loop in alarm “ picture name must be deposited in the info server with every object.

This definition must be done in the dialog of information in the register "service" .
Explained (see project engineering manual)

Faceplate of the disturbed object call

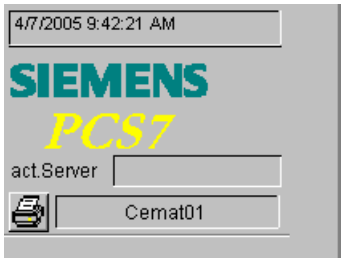
In the Faceplate of the disturbed object you have the possibility to call the subsequent dialogs, DIAGNOSIS and INFORMATION.

Copyright © Siemens AG. All Rights Reserved.

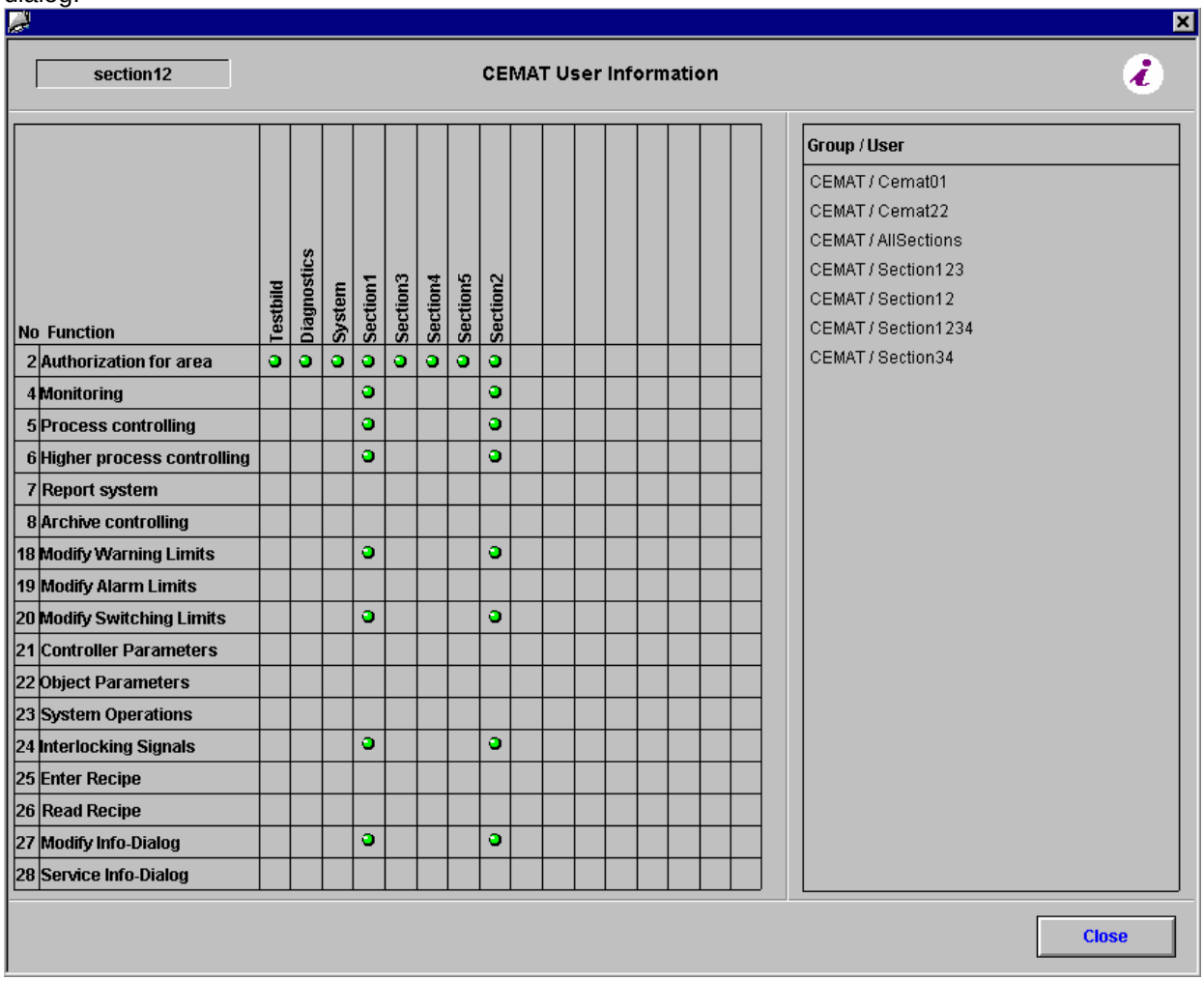
On-line user's right and server name register

In the overview area are indicated the actual server name for the selected area and the actually logged in user.

Now there is the possibility from the overview area to indicate the authorizations of this actual user.



Click in addition with the right mouse button on the user-expenditure field and you receive the lower dialog.



No	Function	Testbild	Diagnostics	System	Section1	Section3	Section4	Section5	Section2
2	Authorization for area	●	●	●	●	●	●	●	●
4	Monitoring				●				●
5	Process controlling				●				●
6	Higher process controlling				●				●
7	Report system								
8	Archive controlling								
18	Modify Warning Limits				●				●
19	Modify Alarm Limits								
20	Modify Switching Limits				●				●
21	Controller Parameters								
22	Object Parameters								
23	System Operations								
24	Interlocking Signals				●				●
25	Enter Recipe								
26	Read Recipe								
27	Modify Info-Dialog				●				●
28	Service Info-Dialog								

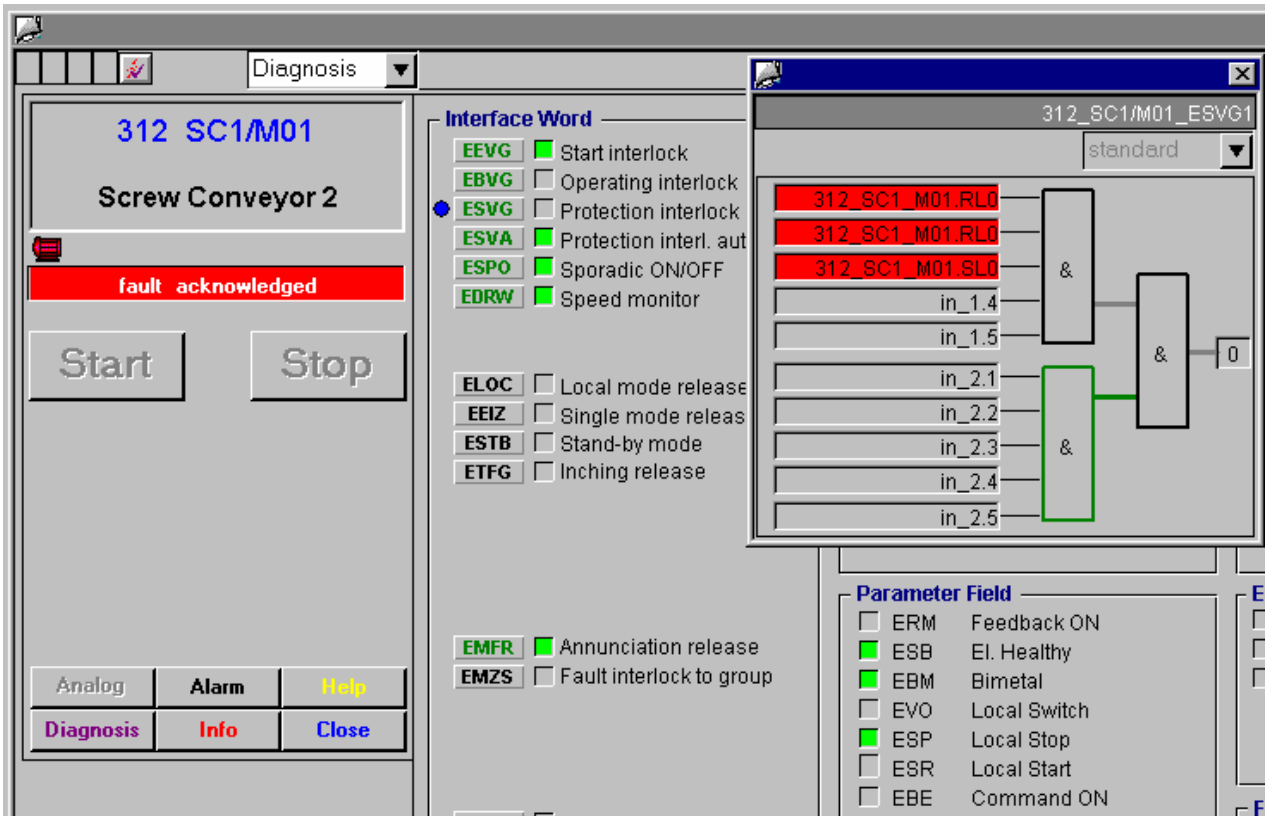
The released rights are displayed here for the current user attachment area.
List of the defined users.

Copyright © Siemens AG. All Rights Reserved.

Extended Diagnosis with the Interlock Module

Display

When an interlock protective circuit is present, the corresponding interface is indicated with a blue point in the diagnostic dialog of the associated module type.



The interlock dialog displays the input parameter name of its logical state and the subsequent interconnection.

In an error situation, the input signal is displayed with a red background.

For the control room operator meaningful designations should be chosen for the input parameters.

Operator Control:

A single click on the corresponding interface designation opens the Interlock dialog.

Clicking on the "Close" key terminates this dialog.

Further functions are not enabled.

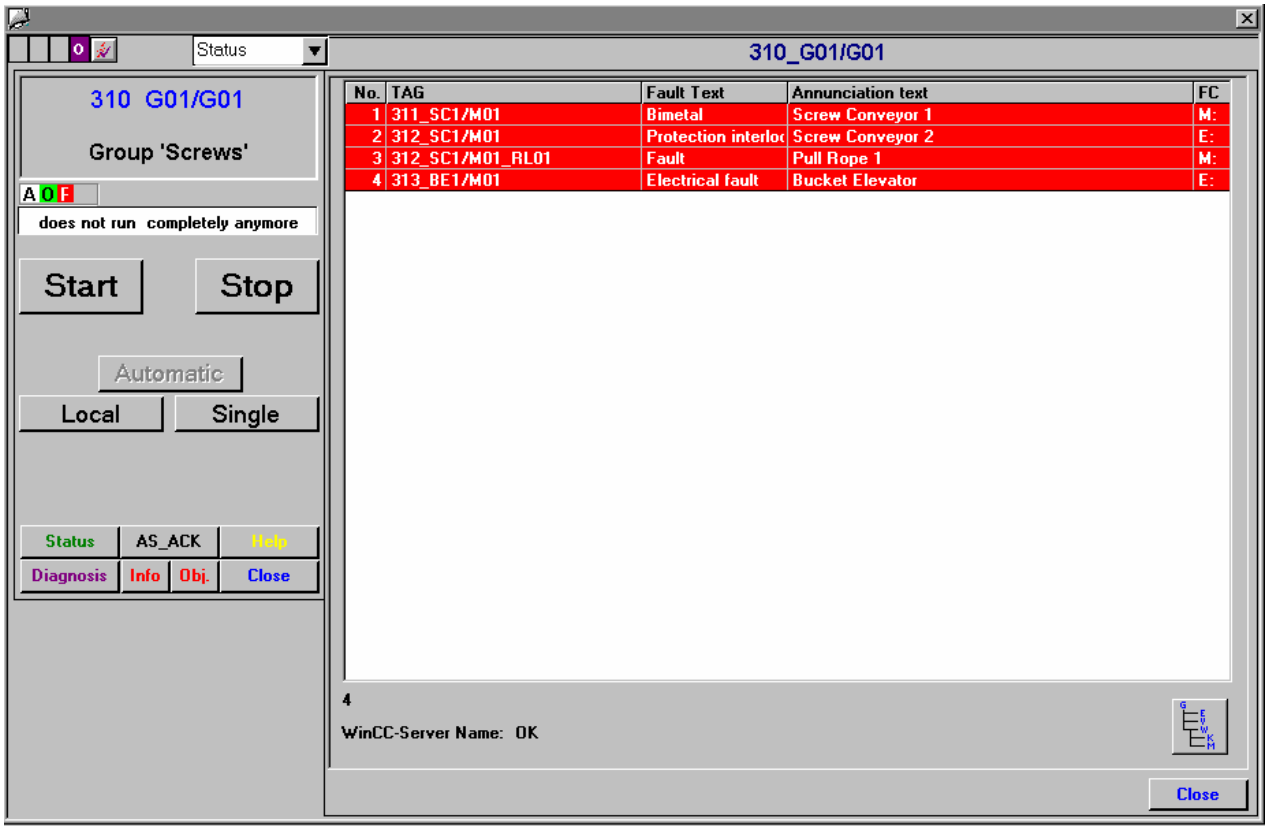
Copyright © Siemens AG. All Rights Reserved.

Specific Dialogs of the Group Module

Indication of the Group Status

All existing faults and interlockings of the drives, measuring values and process signals assigned to the group can be called up with the status call of this group. If there are routes in a group the status call is related to the selected routes of that group

The information will not be taken from the message system, but directly requested from the AS.



The following will be indicated in the table (from the left to the right):

numbering, tag, kind of fault, comment from the module, class of fault.

The number of messages and the WinCC server name are indicated at the left bottom side.

Operation

Single click on the soft key at the right bottom opens the list of all modules assigned to the group (group instance).

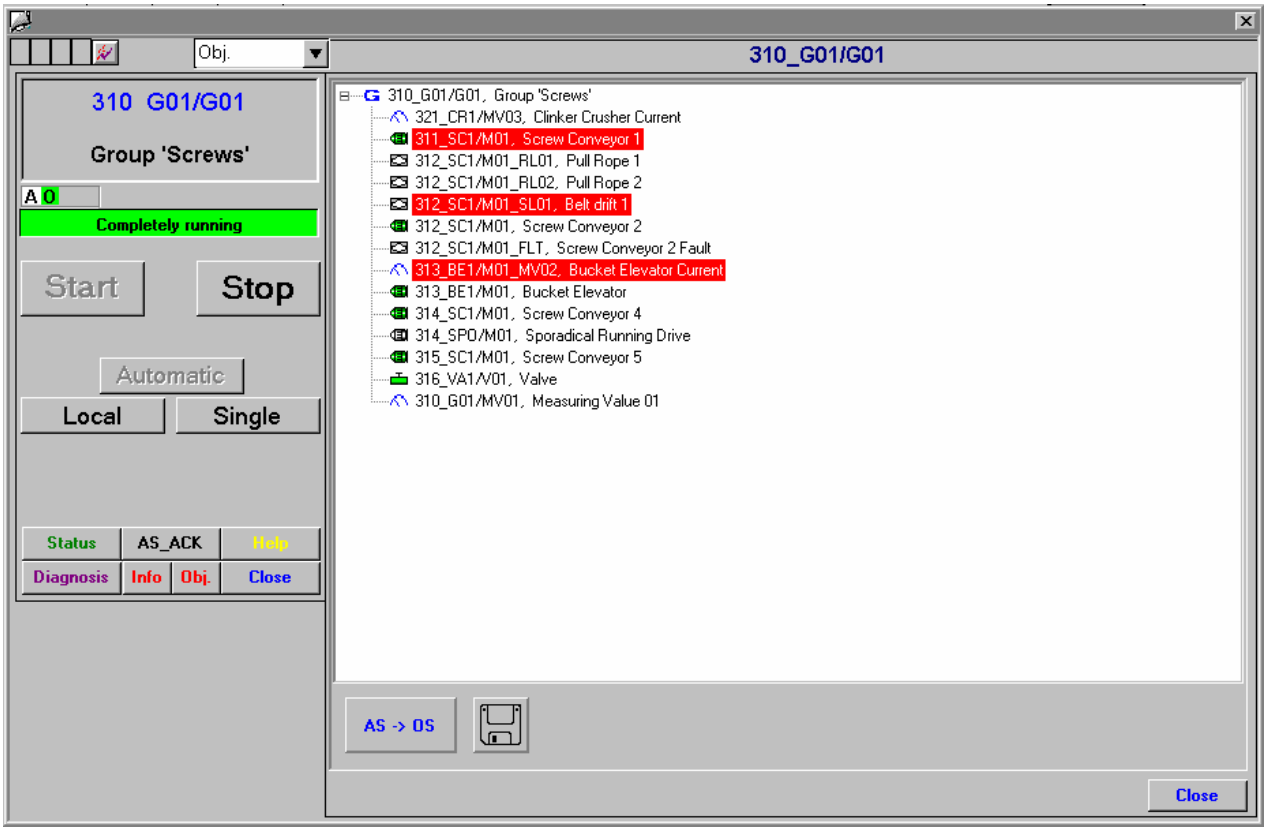
Click on the soft key “close” closes the window.

No further functions are released..

Copyright © Siemens AG. All Rights Reserved.

Presentation of the Group instance list

The group instance list shows all drives, measuring values and process signals which are assigned to the group. The first time you open the group instance list the information will be read from the AS and with the save button it is stored into the user archive. If you open the list again the information is read from the user archive.



The tree structure shows (from the left to the right):

the symbol of the object type with the status ‚off', ‚on', fault'
the tag
the comment to the module

If a bypass function for an object is activated or if the object is in Simulation mode the line is shown in red color.

Operation

Single click on the soft key named „AS-OS" at the left button side calls up again the objects from the AS and shows them unsorted in the tree structure.

Selecting an object with the left mouse key it can be shifted to any position. Thus, the real start-up sequence as per the interlocking can be indicated.

A click on the soft key „save" (disc symbol) stores the new tree structure to the user archive.

The window will be closed by clicking on the soft key „close".

No further functions are released.

Copyright © Siemens AG. All Rights Reserved.

Acknowledgement mode

There are two modes for the acknowledgement of a fault in the PLC. The fault acknowledgement can be carried out for the complete PLC or group-wise.

By default the acknowledgement is carried out for the complete PLC. If the acknowledgement shall be carried out group-wise the setting in the system chart must be adapted and an additional programming is required per Object (refer to Engineering Manual, PLC-Engineering).

AS-wide Acknowledgement (Default)

Mode of action:
If a fault generates an alarm, the alarm appears in the alarm line. Pressing the Acknowledge button in the alarm line, the alarm disappears and at the same time the fault for the corresponding PLC is acknowledged.

The PLC can also be acknowledged by pressing the Button “AS_ACK” in the group faceplate.

Group-wise Acknowledgement

Mode of action:
If a fault generates an alarm, the alarm appears in the alarm line. Pressing the acknowledge button in the alarm line, only the alarm disappears.

In order to acknowledge the fault in the AS you have to open the group faceplate and press button „GRP_ACK“. Only the modules belonging to this group will be acknowledged by this button.

Copyright © Siemens AG. All Rights Reserved.

Sequence Test

In this special operating mode the Program can be tested with the CEMAT blocks without connecting real I/O cards.

Operating Principle:

For the motors the feedback of the main contactor and an eventually connected speed monitor is simulated. For the damper and the valve the limit switches are simulated. The positioning mode of the damper is not supported.

All input signals like ESB, EVO, EBM etc. must be simulated at the beginning of OB1.

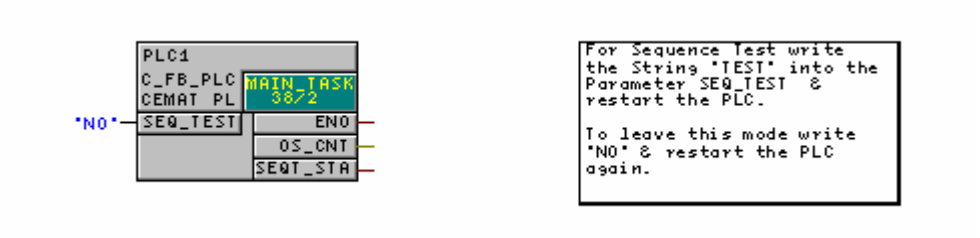
If driver blocks are used, the output SIM_ON can be connected to the corresponding input SIM_ON of the driver block.

All output signals are forced to 0-Signal. This is takes place for security reasons, in case the hardware is already connected.

Start and Stop of the Sequence Test

In the Sequence test mode the program can be tested without Hardware inputs and outputs. It is a pure simulation mode and can only be activated or deactivated with a restart of the PLC.

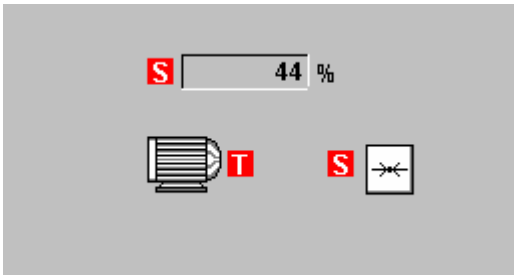
Start and Stop of the Sequence test mode is carried out in system chart, block C_FB_PLC, via Parameter SEQ_TEST.



To start the sequence test mode, enter string ‘TEST’ on input parameter SEQ_TEST and restart the PLC. The PLC is now started in the Sequence Test Mode. For all CEMAT blocks the output SIM_ON is set to 1-Signal.

Note: When the PLC is switched into Sequence Test Mode the annunciation blocks and the measuring values are automatically switched to simulation. If these signals are required for your test, the simulation can be switched off again in the diagnostic picture.

If the corresponding symbols are used, an additional indication beside the symbol will show that the object is switched to sequence test mode. At the drive symbols a “T” for Test Mode is displayed and at the Annunciations and Measures an “S” for Simulation is shown.



To leave the sequence test mode, enter string ‘NO’ on input parameter SEQ_TEST and restart the PLC. The PLC will then start in the normal mode again.

Copyright © Siemens AG. All Rights Reserved.

Adapter Module for Non-CEMAT Modules

Display

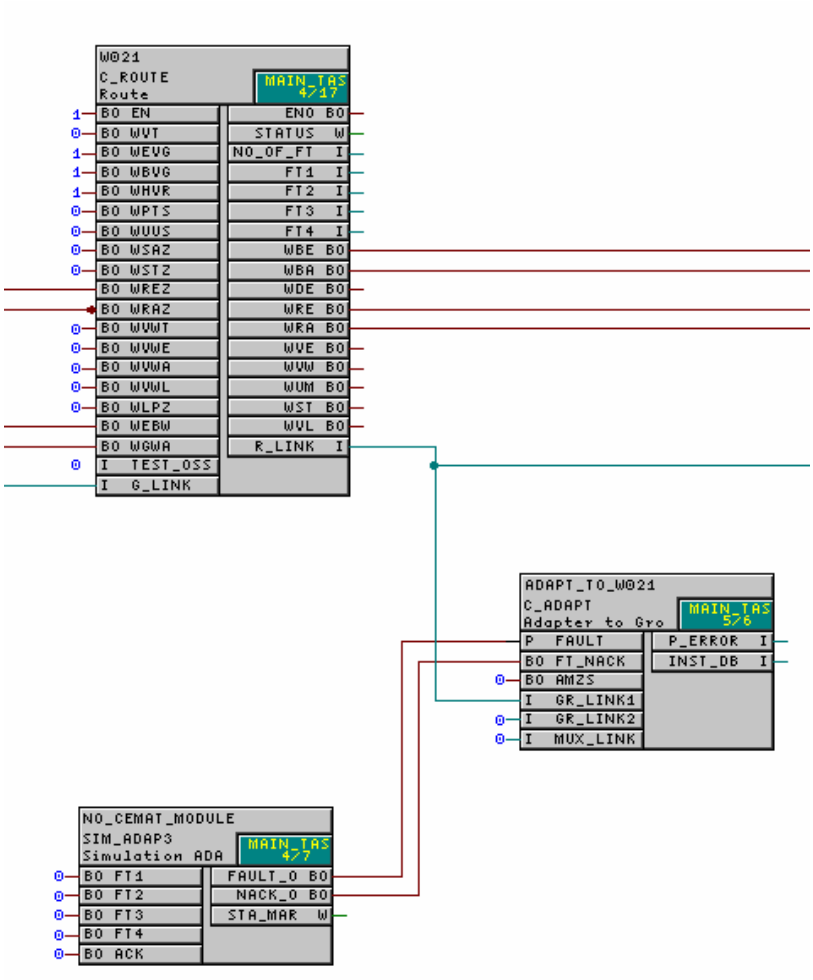
No user interface

Function

The C_ADAPT can connect non-CEMAT modules to CEMAT groups and routes.

In the case of faults of the non-CEMAT module, this is also displayed on the collective display for group / route. When a status call is made, the TAG and the module comment from the non-CEMAT modules are displayed in the status messages window.

In the group instance list the non-CEMAT modules are also displayed. With double-click on a non-CEMAT module the corresponding faceplate will be opened.
If the non-CEMAT module also has a status word with unique information for: “Motor stopped”, “Motor running”, “Motor faulty”, the status of the module can also be displayed in the group instance list, using a Config-File which has to be created and parameterized accordingly.



In order to display the status of the non-CEMAT module in the group instance list, a config-file has to be created and parameterized accordingly.

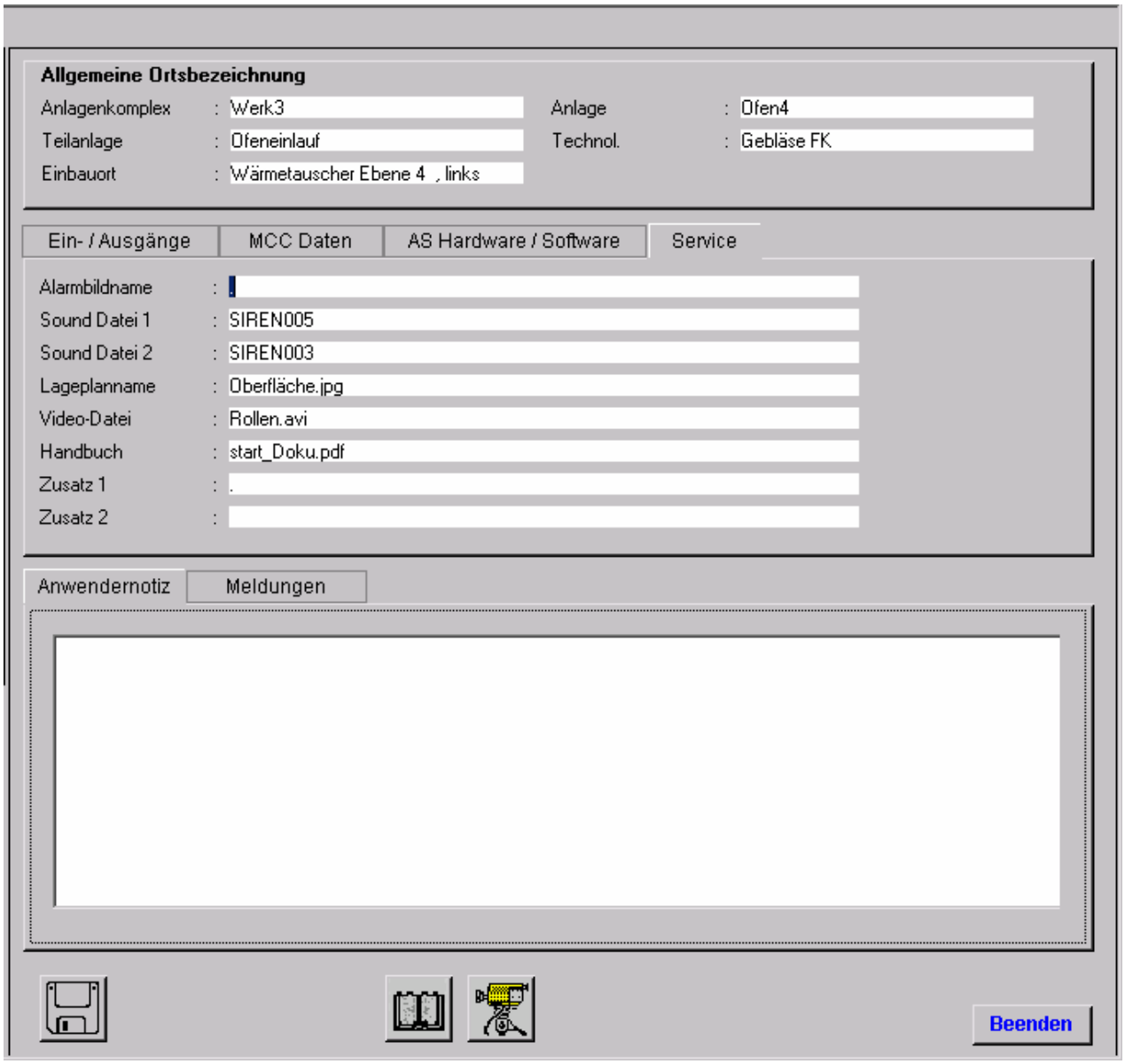
See Object description C_ADAPT.

Copyright © Siemens AG. All Rights Reserved.

Multimedia Interfaces

Display

The display is linked to a function and thus depends on the associated application.
The customer can deposit independent information to every object and display them by actuate a button which called a "Viewer".



In the picture the buttons are released for the call of the manual and the video file.

The application video and maintenance manual were implemented as a sample application.

All additional applications depend on the end user, because it is not known how, for example, MCC plans or circuit diagrams are present or where these are saved.

Copyright © Siemens AG. All Rights Reserved.

The functions in the overview:

Sound output

Dialog with sound replay mechanisms (USER)
as defined under service " **Sound File1** "

Location plan:

Display of the exact position of the object in the works (USER
as defined under service " **Location plan** "

Service manual:

Descriptions for trouble-shooting for this object (USER)
as defined under service " **Service manual** "

Video guide:

Video description for trouble-shooting (USER)
as defined under service " **Video guide** "

Circuit diagram:
not shown
Circuit diagram of the object (not displayed)
as defined under service " **Circuit diagram** "

Function plan:
not shown
Locking logic for this object (not displayed)
as defined under service " **Function plan** "

In every register a button is available to call the hardware drawings on this subject .

Input/output assignment:

Assignment of the input/output cards (cabinet assignment)

MCC field:

Assignment of the MCC cabinet (cabinet assignment)

AS hardware:

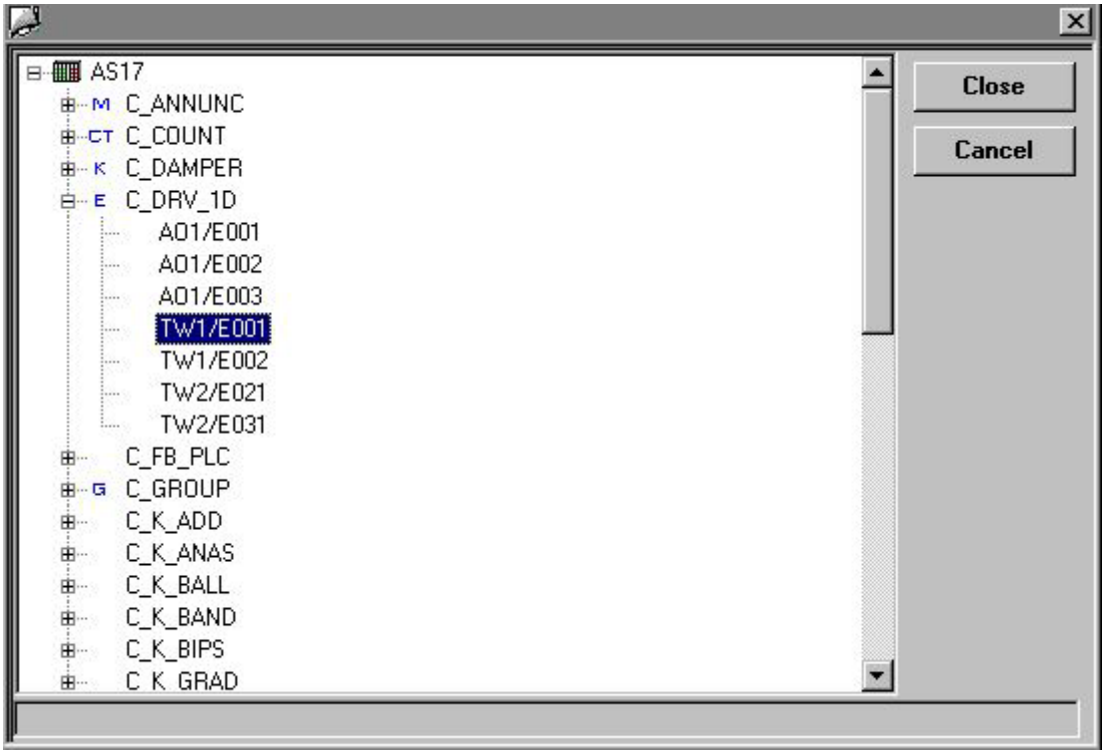
Construction of the cabinet in which the AS is installed which this object belongs to (cabinet assignment).

Copyright © Siemens AG. All Rights Reserved.

CEMAT Object Browser

Display

Object tree with AS devices as root. Then branch to Object types and then to Object display.

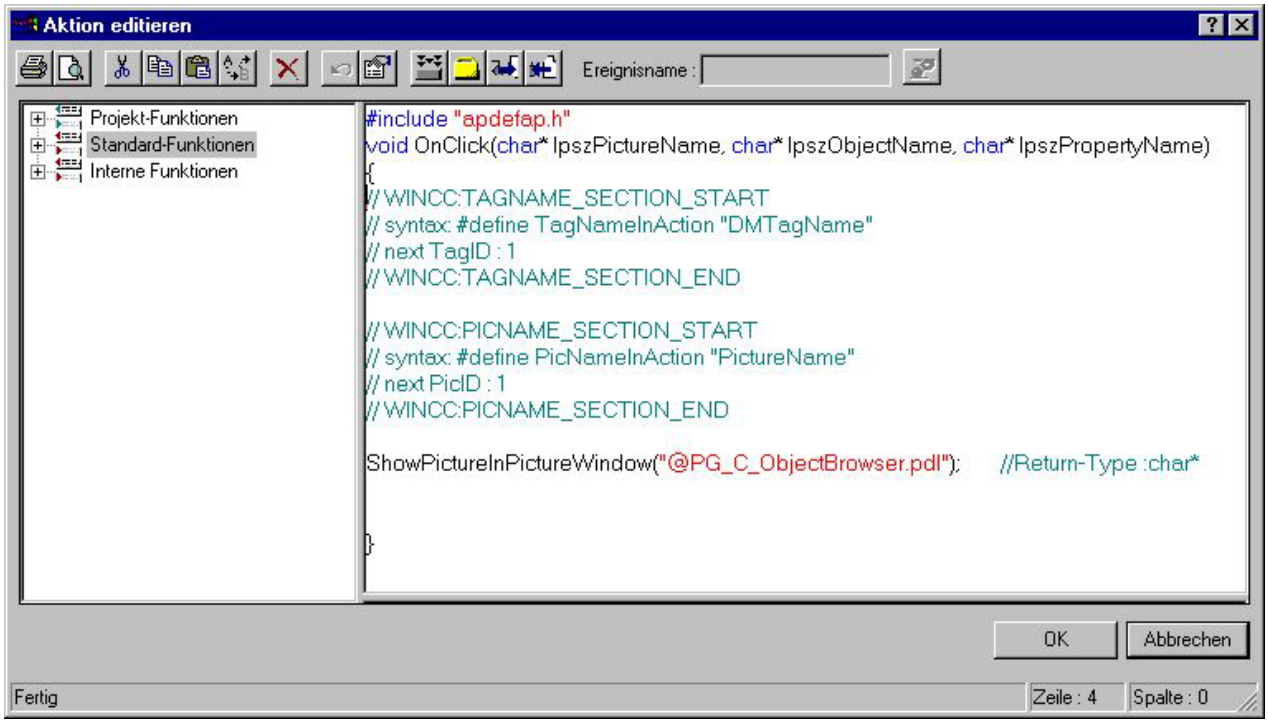


Double-click to initiate the object operation.

Copyright © Siemens AG. All Rights Reserved.

Configuring

A key must be configured in a process picture or a function toolbar and the following function call included.



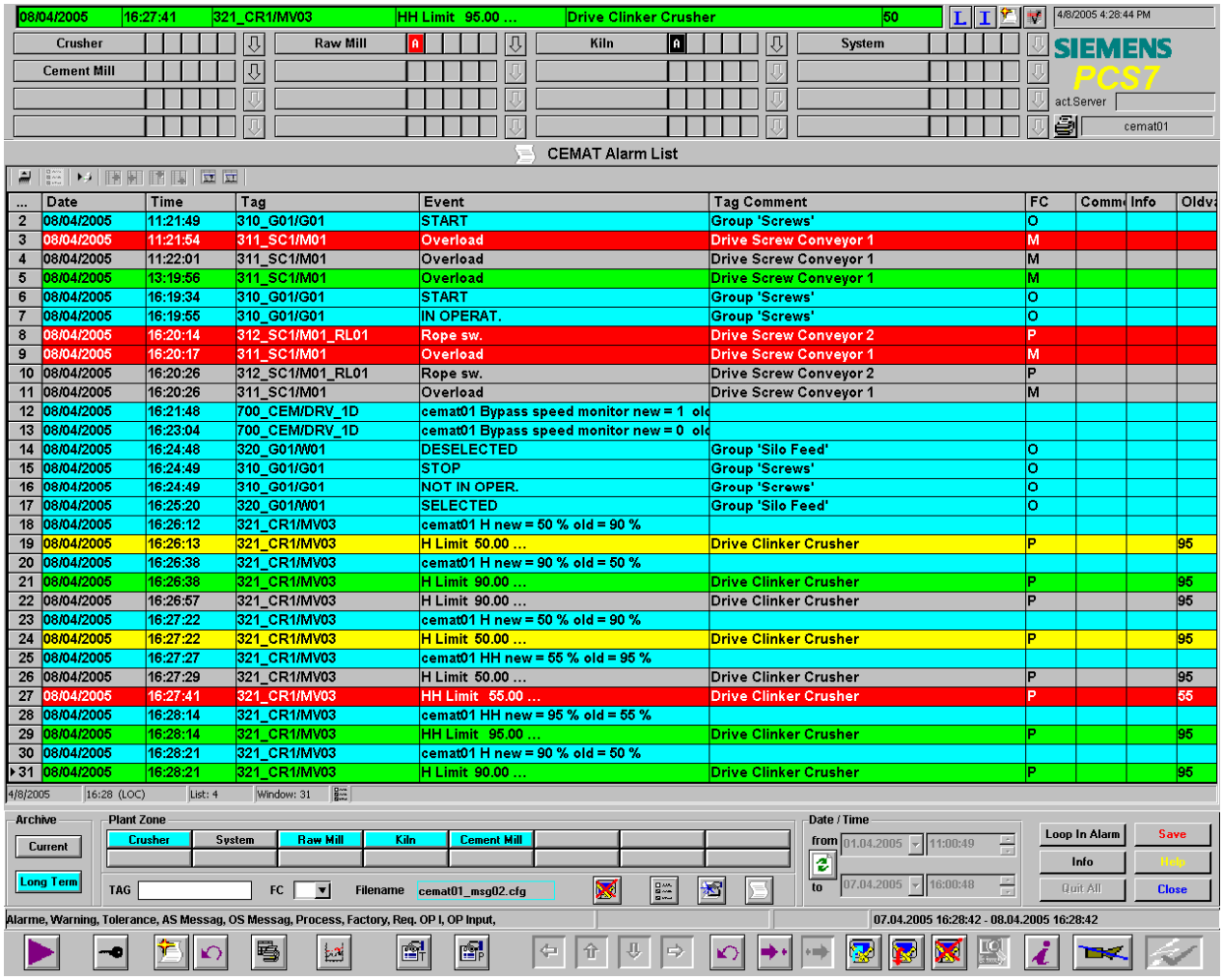
Copyright © Siemens AG. All Rights Reserved.

CEMAT Message Dialog

If you open the CEMAT message list, the previously defined settings are recovered.

If you close the CEMAT message list with the ‘Close’ Button, the actual settings are saved and the previous process picture is displayed again.

Display


08/04/2005 16:27:41 321_CR1/MV03 HH Limit 95.00 ... Drive Clinker Crusher 50
4/8/2005 4:28:44 PM
Crusher
Raw Mill
Kiln
System
Cement Mill
SIEMENS
PCS7
act.Server
cemat01
CEMAT Alarm List
... Date Time Tag Event Tag Comment FC Comm Info Oldv
2 08/04/2005 11:21:49 310_G01/G01 START Group 'Screws' O
3 08/04/2005 11:21:54 311_SC1/M01 Overload Drive Screw Conveyor 1 M
4 08/04/2005 11:22:01 311_SC1/M01 Overload Drive Screw Conveyor 1 M
5 08/04/2005 13:19:56 311_SC1/M01 Overload Drive Screw Conveyor 1 M
6 08/04/2005 16:19:34 310_G01/G01 START Group 'Screws' O
7 08/04/2005 16:19:55 310_G01/G01 IN OPERAT. Group 'Screws' O
8 08/04/2005 16:20:14 312_SC1/M01_RL01 Rope sw. Drive Screw Conveyor 2 P
9 08/04/2005 16:20:17 311_SC1/M01 Overload Drive Screw Conveyor 1 M
10 08/04/2005 16:20:26 312_SC1/M01_RL01 Rope sw. Drive Screw Conveyor 2 P
11 08/04/2005 16:20:26 311_SC1/M01 Overload Drive Screw Conveyor 1 M
12 08/04/2005 16:21:48 700_CEM/DRV_1D cemat01 Bypass speed monitor new = 1 old
13 08/04/2005 16:23:04 700_CEM/DRV_1D cemat01 Bypass speed monitor new = 0 old
14 08/04/2005 16:24:48 320_G01/W01 DESELECTED Group 'Silo Feed' O
15 08/04/2005 16:24:49 310_G01/G01 STOP Group 'Screws' O
16 08/04/2005 16:24:49 310_G01/G01 NOT IN OPER. Group 'Screws' O
17 08/04/2005 16:25:20 320_G01/W01 SELECTED Group 'Silo Feed' O
18 08/04/2005 16:26:12 321_CR1/MV03 cemat01 H new = 50 % old = 90 %
19 08/04/2005 16:26:13 321_CR1/MV03 H Limit 50.00 ... Drive Clinker Crusher P 95
20 08/04/2005 16:26:38 321_CR1/MV03 cemat01 H new = 90 % old = 50 %
21 08/04/2005 16:26:38 321_CR1/MV03 H Limit 90.00 ... Drive Clinker Crusher P 95
22 08/04/2005 16:26:57 321_CR1/MV03 H Limit 90.00 ... Drive Clinker Crusher P 95
23 08/04/2005 16:27:22 321_CR1/MV03 cemat01 H new = 50 % old = 90 %
24 08/04/2005 16:27:22 321_CR1/MV03 H Limit 50.00 ... Drive Clinker Crusher P 95
25 08/04/2005 16:27:27 321_CR1/MV03 cemat01 HH new = 55 % old = 95 %
26 08/04/2005 16:27:29 321_CR1/MV03 H Limit 50.00 ... Drive Clinker Crusher P 95
27 08/04/2005 16:27:41 321_CR1/MV03 HH Limit 55.00 ... Drive Clinker Crusher P 55
28 08/04/2005 16:28:14 321_CR1/MV03 cemat01 HH new = 95 % old = 55 %
29 08/04/2005 16:28:14 321_CR1/MV03 HH Limit 95.00 ... Drive Clinker Crusher P 95
30 08/04/2005 16:28:21 321_CR1/MV03 cemat01 H new = 90 % old = 50 %
31 08/04/2005 16:28:21 321_CR1/MV03 H Limit 90.00 ... Drive Clinker Crusher P 95
4/8/2005 16:28 (LOC) List: 4 Window: 31
Archive
Current
Long Term
Plant Zone
Crusher System Raw Mill Kiln Cement Mill
TAG FC Filename cemat01_msg02.cfg
Date / Time
from 01.04.2005 11:00:49
to 07.04.2005 16:00:48
Loop In Alarm Save
Info Help
Quit All Close
Alarme, Warning, Tolerance, AS Messag, OS Messag, Process, Factory, Req. OP I, OP Input,
07.04.2005 16:28:42 - 08.04.2005 16:28:42

Structure

The message list window consists of three areas.

1. Toolbar message window
2. Message list
3. Selection input dialog.

Toolbar message window

The toolbar message window displays 9 icons whose functions are described under *Operator Control*.

Copyright © Siemens AG. All Rights Reserved.

Message list structure

Depending on the message class, the message list provides the following information:

For alarms, warnings, system and operational messages

Column text	Description
Incoming time	With date / time
Plant identifier	As defined for Object
Event (fault type)	Depending on the object fault types (e.g. operational)
Message text	As defined for Object
Fault class	E: electrical, M: mechanical, P: process, S: safety (emergency off)
Message note	Identification that a note exists for this message
Value	Used only for certain messages (object message text)

For operator messages

Column text	Description
Incoming time	With date / time
Plant identifier	As defined for Object
Fault type	Depending on the object fault types (e.g. operational)
Message text	As defined for Object
Operator control	Operator, new value, old value, dimension
Message note	Identification that a note exists for this message

Color attributes

Depending on the message class and message state, the messages are displayed in the following colors:

	Alarm	Warning	Oper. / Change	System
Message arrived	white / red	black / yellow	black / blue	white / violet
Message sent	white / light green	white / light green	-	black / light green
Message arrived. Acknowledged	black / pink	black / light yellow	-	white / dark pink
Message sent. Acknowledged	white / dark green	white / dark green	-	white / dark green

Listing of the fault classes

Electrical	E
Mechanical	M
Safety (emergency off switch)	S
Process-conditional	P

Selection input mask

Refer to Operator Control

Copyright © Siemens AG. All Rights Reserved.

Operator Control

Call CEMAT message dialog:

Use the key with the blue "C“ in the general toolbar.

.

Operate toolbars:

1. Auto-Scroll On/Off

If the "Auto Scrolling" option is activated, the most recent message is always selected in the message window. The visible area of the message window will be moved if necessary.
If the "Auto Scrolling" option is not activated, a newly arrived message is not selected. The visible area of the message window does not change.
The specific selection of message lines is possible only when "Auto Scrolling" is not activated.

2. Selection

Specify the selection criteria for the messages to be displayed in the message window. Although the messages that satisfy these criteria are not displayed, they are archived.

3. Log functions

Function to create paper-based documentation.

4. Start of the list

Select the first of the currently pending messages. The visible area of the message window will be moved if necessary. The button can be operated only when the "Auto Scrolling" function has been deactivated.

5. End of the list

Select the last of the currently pending messages. The visible area of the message window will be moved if necessary. The button can be operated only when the "Auto Scrolling" function has been deactivated.

6. Next message

Select the next message relative to the selected message. The visible area of the message window may be moved. The button can be operated only when the "Auto Scrolling" function has been deactivated.

7. Previous

Select the previous message relative to the selected message. The visible area of the message window will be moved if necessary. The button can be operated only when the "Auto Scrolling" function has been deactivated.

8. Info text

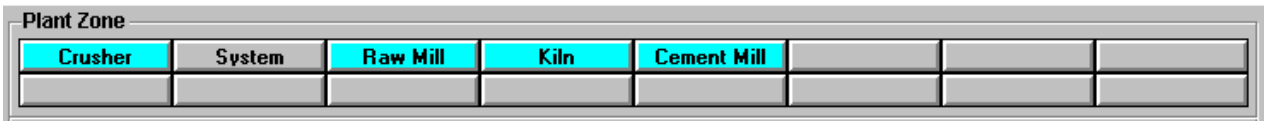
Opens a dialog to enter information text.

9. Comment

Opens a text editor to enter comments.

In the "Scrolling OFF" state, the horizontal scrollbars (below the messages) can be used to display additional message line information.

Selection of the Areas:



The areas can be selected/deselected by pressing the corresponding area button. Selected Areas are shown in cyan color, deselected areas are gray.

Copyright © Siemens AG. All Rights Reserved.

Operate selection area

Grouping	Individual points	Description
Archives	Current	Displays the currently pending messages.
	Long Term	Displays all unacknowledged and acknowledged messages, operational messages and change messages of the last 24 hours.
Plant Zone	List of Areas	Selection/ deselection by pressing the Area Button.
TAG	Direct input	Can only be operated if long term is selected: partial string possible
FC	Fault class	Can only be operated if long term is selected: Select using drop-down menu.
Filter – Button Message classes	Alarm Warning Tolerance AS control system alarm OS control system alarm Process messages Operational message Operator requests Operator messages	The filter button opens the filter dialog (see below): The display in the left status line will be actualized. Selection using the accompanying criteria. Combinations of the message classes can be selected. If no message class is selected, messages for all message classes are output. The filter button can not be operated if the operation list is selected.
Date / Time	Date input fields from – to Time input fields from – to	Can only be operated if long term is selected: Input fields for date/time.
	Refresh	Refreshes the display according to the settings for date/time. The display of the right status line is deleted.
File name	Name under which the selection (filter) is stored.	Can only be operated if long term is selected: With click on the name field the file open dialog appears (see below).
General Operations	Actualize message list	Can only be operated if long term is selected: After any change of selection in the long term archive, this button must be pressed. The display of the current archive is updated automatically. The display of the right status line is updated. The Filter buttons are enabled again.
	Actualize Operation list	Can only be operated if long term is selected: Actualizes the display of the operation messages. The display of the right status line is updated. The operation of the filter buttons is disabled.
	Filter standard setting	Deletes all filter settings, restores the standard filter settings and updates the display.

Copyright © Siemens AG. All Rights Reserved.

	Loop In Alarm	After being clicked, the process picture that displays the faulty object (motor, measured value,....) is called.
	Info	After being clicked, the standard dialog of the object is opened.
	Quit All	Can only be operated if 'Current' is selected: Acknowledge each page individually.
	Save	With 'Save' the Save as dialog opens (see below): The Selections are saved in a file. These can be opened later on by click on 'Filename'.
	Help	Opens the das CEMAT – Version window.
	Close	The CEMAT message system will be closed and the actual selections are saved automatically. Returns to the previous process picture.

Status line:

The status line can be seen at the bottom of the CEMAT message system.
At the left side the selected message classes are displayed and at the right side you will find the time frame. If the date/time filter is activated the right side is empty.

Within the message list:

- Scroll forwards (by line)
- Scroll backwards (by line)
- Scroll in the direction of older messages
- Scroll in the direction of newer messages
- Selection of a message line by clicking it with the left mouse button.

When a message line is selected

- An alarm picture can be selected
- A message note can be entered
- An object-information dialog can be opened
- This message is acknowledged (only in the current alarm list, multi-line acknowledgements possible).

Configuring

No further configuring necessary

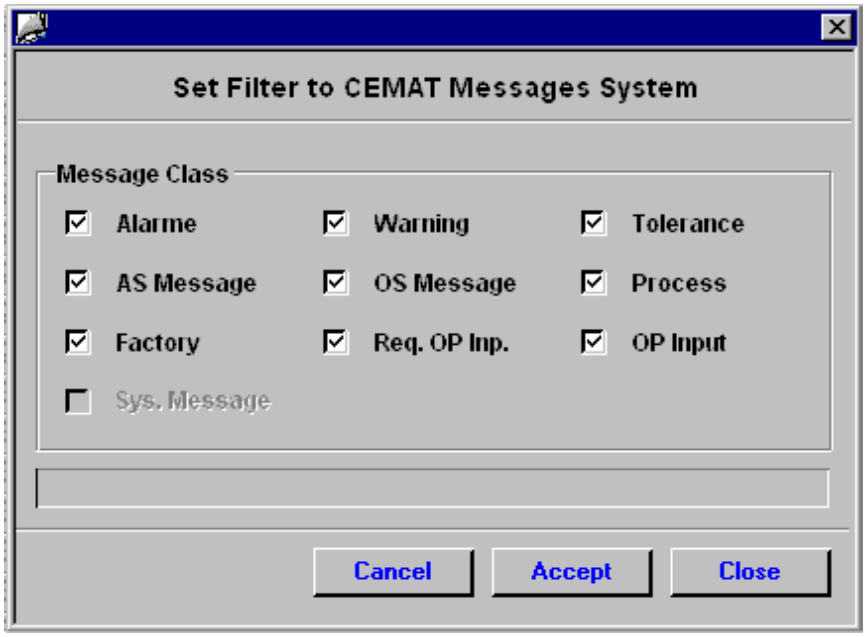
Copyright © Siemens AG. All Rights Reserved.

Dialogs

The Dialogs simplify the operation of the CEMAT message system.

Filter Button

The filter button opens the filter dialog:



The message classes can be selected and deselected.

Cancel: The dialog will be closed without saving the modifications.

Accept: The modifications are saved.

Close: The dialog is closed and the modifications are saved.

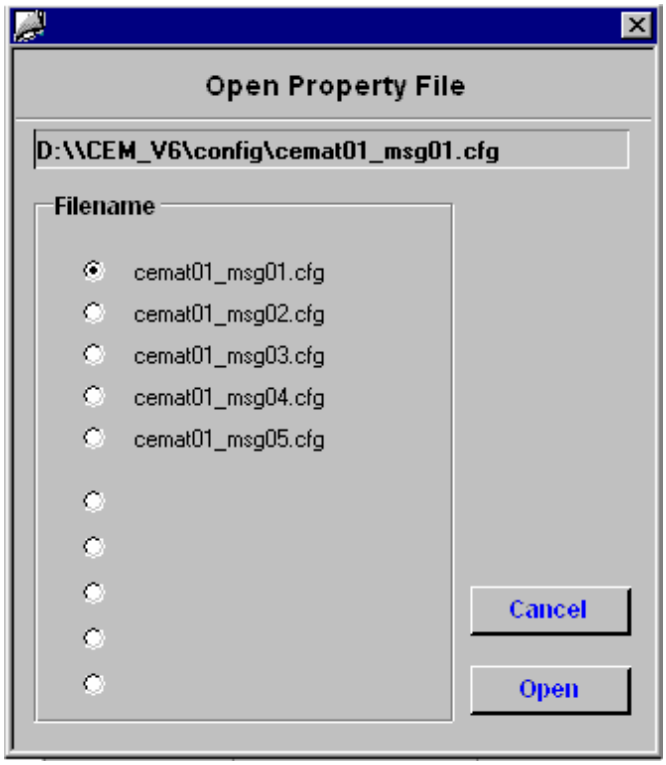
The long term list is will only be refreshed if the refresh button is pressed. The current list is refreshed automatically.

Copyright © Siemens AG. All Rights Reserved.

File name

The file name can only be operated in the long term list.

Click on the name field opens the file open dialog:



Up to 10 files are displayed. You can select only one.

In these files the selections are stored.

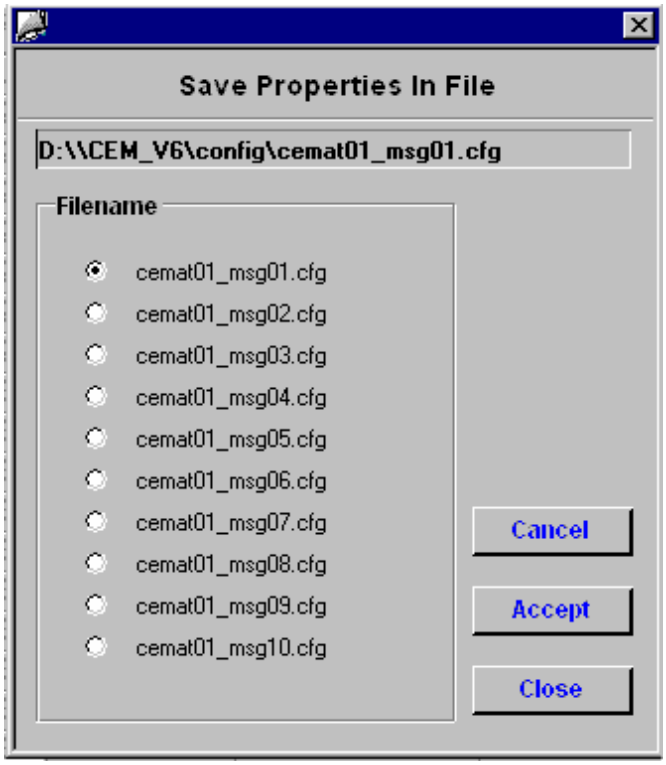
Cancel: The dialog is closed without selection of a new file.

Open: The dialog will be closed and the selected file is used.

Copyright © Siemens AG. All Rights Reserved.

Save

Click on the ‘Save’ button opens the save as dialog:



10 files are displayed. You can select only one.
The file name consists of the actual user name and the suffix _msg01.cfg to _msg10.cfg. The file name can not be modified.

The actual settings in the CEMAT message system can be saved in the selected file.

Cancel: The dialog will be closed without saving in a file.

Accept: The actual settings are saved in the selected file.

Close: The dialog will be closed and the actual settings are saved in the selected file.

Copyright © Siemens AG. All Rights Reserved.

Technical questions regarding the PCS

Q&A	
Question	**Answer**
Is only standard hardware used?	Only SIMATIC standard hardware is used.
Which operating system? Are commercially available relational databases used	The operating system is Microsoft Windows 2000 Prof. Or Server MS SQL is used on the OS servers for object data, messages and user archives.
Details of the start-up times and the set-up time for OS stations.	Start-up times: OS client for running OS server typically 5 min., max. 7 min. OS Server typically 5 min., max. 10 min. Set-up time for an OS station : 30 minutes to replace the hard disk and the installation of the system software and application software. Prerequisite is the availability of a current system backup (image copy) on an external data medium.
Is a maximum outage time of 2 hours guaranteed?	Our plant concept with redundant OS stations, servers and process bus and the reliable, easily replaceable PNK SIMATIC S7-400 forms the basis for high availability. This is supplemented with our service product with guaranteed response times. - Direct service with a powerful remote maintenance tool and access to the automation system via modem and a telecommunications connection. - The remote maintenance permits access to all relevant components in the control system and thus a fast fault correction. On-site service by a known configuring / commissioning engineer from Siemens.
Which servers are required for what? Which data is stored?	Servers as OS servers (Online Server) are needed between the PNK level and the PFK level. Each server is provided as a redundant server pair with automatic archive matching. The following data is maintained on the servers: Object variables and data in the so-called object engine, OE Alarms, warnings, messages, etc., in the message archive Measured values in cyclical archives Recipes, operational data, etc., including user archives.

Copyright © Siemens AG. All Rights Reserved.

Q&A	
Question	**Answer**
Which data is present in the operator station, process station, engineering system, couplers, etc.?	Control program and the process states for drives, valves, controllers, etc. — In the automation systems (AS) S7 400. Thus, the ASes can operate independently without operator control and monitoring level Object variables and object descriptions — In the Data Manager Alarms, warnings, messages, etc. — In the message archive on the OS server Measured values — In the measured value archive (up to 7 days) on the OS server Recipes, plant data — In user archives on the OS server Process pictures — On the OS server and optionally on the clients (improved performance for the time needed to change pictures) Engineering data — On the engineering system or on a separate server
Which CAE functions does the system contain?	Hardware configuration (HW-Config.) for the configuration and parameterization of all hardware components, such as racks, CPUs, CPs for communication, Profibus lines, I/O modules, etc. Technological display of the plants in the form of a tree structure. Graphical conversion of the procedure processes in open- and closed-loop control functions using CFC (Continuous Function Chart) function display. Here, predefined functions and technological objects (from libraries) are displayed and connected graphically. Creation of step sequences using SCF. Here, step-controlled processes are created and parameterized graphically. CFC and SCF can be directly combined and connected with each other. Both editors generate the necessary program code for the PNK and the data for the PFK. Powerful test and diagnostic functions are available for both editors.

Copyright © Siemens AG. All Rights Reserved.

Q&A	
Question	**Answer**
Can new stations be included during running operations? Which steps are necessary?	Yes! The following steps must be performed: - configure and parameterize station on the engineering system - interconnect station - possibly load station - load new project data to the OS servers.
How does the startup of a process station proceed after a failure? Duration?	The startup of the SIMATIC automation systems proceeds automatically as provided by the firmware. The startup of the servers and OS stations proceeds automatically as provided by the startup routine. Duration: typically 5 minutes
Connection of third-party system	Bus system/protocol protocol: Industrial Ethernet with TCP/IP Coupling procedure for third-party computer: OLE for Process Control; OPC Database communication: SQL
Can process sectioning be realized easily without additional effort?	Yes, through the specification of user rights or the assignment of process pictures to an OS station. A corresponding user and rights administration is a system component and contains predefined user/rights assignments for the most common usage.
Is the operator control and monitoring level essential for the operation of the process level?	No, the control program with all interlocks and safety functions for the associated drives, controllers, measured values, etc., runs independently in the associated AS S7 400.
What are possible solutions for OS stations external to the control room?	The WinCC Web Navigator functionality used for island operation satisfies this requirement. Process pictures are called using the browser function. The process pictures of the control system are used here.
Is there an animated function plan display of the application program (CFC/SFC)?	Yes, for CFC and SFC. The animation for the CFC display is currently possible on the engineering system. The SFC display and animation can be invoked at any time in the operator stations in the normal operator control and monitoring mode!

Copyright © Siemens AG. All Rights Reserved.

Q&A	
Question	**Answer**
Definition of the loading (base load + application program) and the calculation of the processor loading (base load + application program) per Maximum cycle time for each PLC?	Loading tests produced an average loading of 35% for the OS stations. The cycle time should be considered as a relevant quantity for the loading of the S7 400 automation system. This depends on the number of implemented objects and can be calculated from this. A limitation to the number of objects maintains a maximum cycle time of 200 ms.
The size for main memory and reserve must be specified.	Main memory for PC stations 1 GB Loading typically 75% Main memory for S7 400 : CPU 416-3 2 x 1.6 MB Loading typically 60%
The hard-disk size and reserve must be specified.	Hard-disk size for PC stations currently 120 GB Maximum 15 GB are reserved for the system software and the project data. The remainder is available for archives and other data.
Is the complete functionality of Profibus DP or DP/PA used?	Profibus DP or DP/PA is used for coupling the distributed peripherals ET200S, converters, weighing systems and intelligent field devices (Profibus PA). Because the associated bus clients determine the usable functionality, no general statement can be made. In the case of systems from third-party manufacturers, in particular , the functionality must be determined in each specific case.
Can small controllers be integrated using Profibus DP? Diagnosis?	Profibus DP can include small controllers in the automation level as slaves. The form and size of the diagnostic functions depend on the type of the associated small controller. The routing functions from Step 7 can be used with the engineering station to perform the diagnosis.
Details of the requirements to be met by the fault immunity.	The offered products satisfy the requirements of the EU regulations 89/336/EWG. "Electromagnetic Compatibility". SIMATIC products are designed for use in the industrial area and satisfy the requirements of the interference radiation in accordance with EN 50081-2: 1993 and the interference immunity in accordance with EN50082-2: 1995
Can the availability of the system (MTBF) for the defined environment conditions be specified?	The availability of the complete system depends on the MTBF times (mean time between failures) of the associated components. When the components offered or recommended by us are used, the complete system has an availability of 99.7%. MTBF of some important components: Hard disk 1,000,000 hours Monitor SCM 2196 – I excl. CRT 50,000 hours incl. CRT 20,000 hours SIMATIC S7-400 CPU 13 – 14 years SIMATIC peripherals ET 200 ... 28 - 57 years

Copyright © Siemens AG. All Rights Reserved.

Q&A	
Question	**Answer**
Is the failure of every bus component recognized? Which are not recognized?	Yes, for the components supplied as standard (communications processors for the PC stations and the AS systems). If products other than those recommended by us are used for the network components, the failure of these components can also be determined.
The type of potential separation for binary and analog inputs and outputs must be described.	ET 200 S peripheral module The 2DI DC 24 V and 2 DI AC 230 V digital inputs are potential separated using optocouplers between channels and backplane bus with a common reference potential. Refer to the section in the ET 200S manual (from page 11 - 7 and 11 - 15) in register 7.3 of the tender folder. The 2 DO Relay digital outputs for 24 DC / 230 V AC are individually potential separate per channel (can be delivered from 07.99). Refer to the section in the ET 200S manual (from page 11 - 39) in register 7.3 of the tender folder. The 2 DO digital outputs 24 VDU, 2 A (alternative) are potential separate using optocouplers to the backplane bus with common L+. Refer to the section in the ET 200S manual (from page 11 - 37) in register 7.3 of the tender folder. The comment on the ET 200S analog modules is contained under register 1.3 in the tender folder. For technical data, refer to the section from the ET 200 S manual (from page 12 - 68, 12 - 75, 12 - 91) in register 7.3 of the tender folder. As described in register 1.3 of the tender folder, we offer the analog modules of the ET 200 M as an alternative. For technical data, refer to the section from the ET 200 M, Ex manual (from page 3 - 73, 3 - 79) in register 7.3 of the tender folder.
Size of the switch-on rush of the power supply units?	The power supply units of the SIMATIC automation systems limit the switch-on current. NAMUR recommendation Part 1 from December 1990
The requirements to be met by the power supply must be specified.	For OS stations, monitors, printer Rated value 230 V AC permitted range: 200 – 240 V AC 50 – 60 Hz For SIMATIC automation systems Rated value 230 V AC permitted range: 170 – 264 V AC 47 – 63 Hz or Rated value 24 V DC permitted range: 20.4 – 28.8 V DC

Copyright © Siemens AG. All Rights Reserved.

Q&A	
Question	**Answer**
Is the loading level of the RAM batteries in the PNK monitored and reported in the case of failures?	Yes, using an optical display on the PNK and a system message to the control system.
What kinds of system status displays are possible? For remote I/O? Representation in lists or graphically? Self-configuring?	The following status displays are possible: On the operator stations: – Additional display for objects in the process pictures – Status call for groups and paths – Status display for SCF step sequences – Status display of the system components (distributed peripherals, PNK, servers, PFK) in system overviews (graphics) On the engineering system: All functions of an operator station and in addition: Status display of all signals and locks in CFC plans All known status and diagnostic functions from S7 / Step7
Which operating modes are provided?	The CEMAT Standard for cement works contains the operating modes: AUTOMATIC, INDIVIDUAL START (locked) and LOCAL OPERATION. Refer to the description in the blue CEMAT Objects folder.
Can all symbol names be chosen freely for lock types and signal names?	As part of PCS7/CEMAT V6, the symbol names can be chosen freely subject to the permitted special characters and the maximum length. The CEMAT Standard largely defines the signal names.
How many characters are available for display of the field lengths of: • alphanumeric symbol names? • the associated designation?	Field length for the symbol name: 32 characters Field length for the designation text: 40 characters
Is it possible to display the overview picture with a marking of the location of the applied main picture?	In the CEMAT Standards, the picture selection is normally available using pull-down menus that are available for each plant section. However, it is possible to mark a specific area of a picture and assign it a button for a picture selection.

Copyright © Siemens AG. All Rights Reserved.

Q&A	
Question	**Answer**
Are all switch-on conditions checked prior to the actual start of a sequence chain?	The switch-on readiness for a group or a path is displayed in the group/path symbol. Detailed information can be requested at any time using the so-called status call for groups and paths. In this case, the message archive with its not corrected alarms is not queried but rather the actual status of the plant. For example, although a switched-off motor circuit-breaker in a stationary plant (subplant) does not produce an alarm, it can be recognized immediately at the group or path symbol as missing interlock. The status call shows the complete message text. All interlocks not defined as standard using modules are recorded using message modules and thus can be recognized as text in the status call. This avoids "test starts".
Is each individual lock condition displayed?	All lock conditions in SCF step sequences can be displayed online on the OS stations. The lock conditions in CFC plans can currently be displayed online only on the engineering system. Because the operator can obtain all necessary information about the status displays and diagnostic pictures of the objects, the status call of the groups and paths, and the message system, the operator is not subject to any information restriction.
Step sequence display with status display. Are the input/output conditions for the previous, current and subsequent step displayed? If not, what is the form of the display?	In the CEMAT Standard, the control of the drives is made primarily as a logic control with higher-level groups and paths. The modules have interfaces for switch-on, operation, protective locks, and switch-on, switch-off commands. Switch-on sequences can be configured in a clear form using changeable switch-on delays from the control system. Switch-off locks (switch-off sequences) can also be configured in the same work step (or later) using switch-off delays. The status of a module of the logic control can be viewed online. However, CEMAT also provides the capability of step sequence control. SFC allows the easy and user-friendly configuring of step sequences and their inclusion in CFC. SFC step sequences can be visualized and, when necessary, operated using the normal user interface on the operator station. The detailed states of the steps and transitions can be invoked using a zoom function.

Copyright © Siemens AG. All Rights Reserved.

Q&A	
Question	**Answer**
Standard module display in the reverse-documentation as black box?	Standard function modules from the PCS7 and CEMAT libraries are displayed as black box with the associated parameters (I/O interfaces). Any unneeded parameters can be switched as invisible. Because the engineering system always serves as the data source for all OS and AS systems, the reverse-documentation function is not necessary for PCS7/CEMAT V6. Thus, changes are always performed on the engineering system, documented and then transferred to the corresponding station. Thus, the project documentation is always up-to-date.
Where is the timestamp of an event assigned? Resolution?	The timestamp for the event message is assigned in the automation system S7 400 (PNK). The resolution corresponds to the cycle time, namely with max. 200 msec.
How is the alarm suppression realized?	An important point in the CEMAT philosophy is the plausibility logic for events, messages. Principle: only the initiating signal is reported.
Are secondary alarms generally avoided?	Every module contains a plausibility logic. The signals for each module are best linked together with the "message release" signal interface. The user connects the message release with the states belonging to the drive / measuring point, such as emergency off, signal voltage protection or also process signals, such as pump-off limit value exceeded, wait time expired, etc. The results are unique messages, no "message flood". Meaningful information in the message archive!
Is the alarm acknowledged just once in the complete system?	The acknowledgement (horn) is performed once per complete system. The alarm acknowledgement of the message line is performed for each pending line. The acknowledgement in the alarm list is made for the marked messages!
How is the alarm tracked from the alarm line?	Trackball/mouse is used on the pending alarm in the message line to select the associated process picture. Further information about the S7 cabinet installation location or motor outgoing feeder panel is available in the information screen forms of the faulty object.
Do outputs assume the safe operational state when the complete station or, for example, the CPU fails?	All outputs of the SIMATIC peripherals assume the OFF state (O-signal) for power failure, bus failure, CPU failure. Faults at the output modules themselves can cause them to remain in the ON state (1-signal).

Copyright © Siemens AG. All Rights Reserved.

Q&A	
Question	**Answer**
How is the control system protected against unauthorized accesses during remote diagnosis and maintenance?	RAS Service (Remote Access Service) from Microsoft or the remote control software pcANYWHERE from Symantec are used for the remote diagnosis. Access rights with password protection are assigned in both cases. A so-called call-back variant can be used to protect the establishing of the connection. Finally, the operator can expressly establish the physical connection between modem and control system only at the time of the remote diagnosis.
Is the application software checked by the manufacturer on a manufacturer's in-house system or must the target hardware be used?	Manufacturer's systems or the target systems can be used for the engineering. The test of the application software and the Factory Acceptance Test (FAT) must always be performed on the target hardware.

Copyright © Siemens AG. All Rights Reserved.

Device Functionality and Configuration Examples

CEMAT is built in a modular fashion, i.e. you can configure your control system to meet your wishes and requirements.

Device Designations and Functions:

Operator Station (OS)

An OS is designated as being a process operator station that uses the Infobus to communicate with the servers.
Functions:

- Administers picture data (in case of PLC-Cache use)
- Communication with servers
- Process management user interface present.

Server

A server is designated as being a PC that can communicate with SIMATIC- S5/ S7 PLCs and OS stations. The process image is maintained and the archiving of the messages / measured values performed on the server unit. Functions:

- Administers message archives
- Administers curve archives (when curve server activated)
- Communication with PLCs
- Communication with OS devices
- Central confirmation and recipe administration
- As a multi-user system it can supply 16 OS devices.

Central Archivserver (CAS)

Archive data that need to remain available for extended periods can be stored externally on a central archive server.

SIMATIC PCS 7 V6.1 supports a central archive server to store and administrate measuring values, messages, alarms and reports, as well as the SIMATIC BATCH data (optional) of up to 12 servers/server pairs.

Up to 10.000 process values/sec. can be archived

All data can be saved on commercially available memory media, e.g. DVD:
- when a certain hard disk volume is
- by operator control

The process values from the CAS can be displayed on an OS Client using standard means of the Operator System

OS Web functionality

SIMATIC PCS 7 V6.1 now permits operator input and control of a plant via Internet or Intranet. A PCS 7 Web Server can be implemented by installing the PCS 7 Web Server V6.1 software on a PCS 7 OS Server basic unit with Windows Server 2003 operating system and OS Software Client V6.1 license. The PCS 7 Web Server makes use of the mechanisms of a Multi Client for the access to subordinated OS Servers.

The OS Web Clients can access the project data provided on the OS Web Server via Internet or Intranet. The OS Web Clients only require an Internet Explorer with simple plug-ins for this purpose. The latter only have to be installed once via the Web. The process screens are converted by "publishing" for the representation in the Internet Explorer. The process screens displayed on the OS Web Client can be controlled and monitored in the same way as with an OS Client. The operator must log on as for an OS

Copyright © Siemens AG. All Rights Reserved.

Client and the same rules apply for administrator rights as with OS Clients. Operator inputs on the OS Web Client included in the operator log.

The integrated OS User Management ensures increased security when the PCS 7 Web Server accesses the OS Servers. Plant access can be protected in accordance with the relevant security requirements by password, firewall technology or by individual security concepts

Maintenance Station (MS)

Asset Management includes the administration and management of the process control equipment of a technological plant under the aspect of maintaining or even increasing its value by error diagnostics and correction, as well as preventive and anticipatory maintenance measures.

Maintenance functions and information that were previously located at a separate level are now integrated seamlessly into SIMATIC PCS 7 in the form of a Maintenance Station (MS). With the Maintenance Station the maintenance technician gets a complete overview of the diagnostic and maintenance information of all assets, i.e. the system components of a plant. This also includes intelligent field devices, I/O modules, controllers, fieldbus, terminal bus and system bus components or operator stations. The information is filtered and processed for each user in accordance with his area of responsibility.
Depending on the architecture of the PCS 7 system, the Maintenance Station can be implemented on the basis of a SIMATIC PCS 7 BOX, a PCS 7 Single Station or a Client-Server combination

Engineering Station

An ENG is designated as being a central engineering station.
Functions:

- Engineering of PLC and OS applications with the PCS7 data manager.
- Process picture creation with WinCC
- Central storage of the engineering data
- Administers picture data
- Process management user interface online test
- Communication with ASes
- Remote diagnosis using RAS
- Step 7 Software
- Step 5 Software can be installed if needed.

AS or AG Automation Unit

Base functions for open/close-loop control, measurement, groups, paths
Communication to the control system
Communication from AS to AS

Terminal bus:

Via terminal bus the (TCP/IP protocol) the OS Server data is transfered to the Multi Clients

The new Gigabit technology on the basis of the modular SCALANCE X414-3E switch and 8-core electrical (Twisted Pair) or optical cables from SIMATIC NET result in top communication performance, particularly in the case of very large plant with a big quantity framework and extensive communication networks..

Plant bus:

Via plant bus (PROFIBUS, Industrial or Fast Ethernet) the interconnection between PLCs is performed and the Process values are transfered from the PLCs to the OS and OS Servers.

Field bus:

Copyright © Siemens AG. All Rights Reserved.

The field bus transfers the process values from decentralised peripheral units to the PLCs. Some of the field units can be parametrized via this bus.

OSM/ ORM/ Switch:

With the Optical Redundancy Manager and the Optical Switch Modules of the Fast Ethernet it is possible to build an optical ring with a baudrate of 100Mbits.

Scalable performance increase 100/1.000 Mbit/s due to the introduction of the new SCALANCE X switch family

Printer:

Print output to a file or the printer
- Selectable connection of the printer (parallel, serial, remote printer)
- Support for all printers that can run under Windows NT

Printer types:
- Hardcopy printer to print a process picture
- Logging printer to print a message list or a recipe
- Engineering data printer to print the project data.

Availability, Redundancy

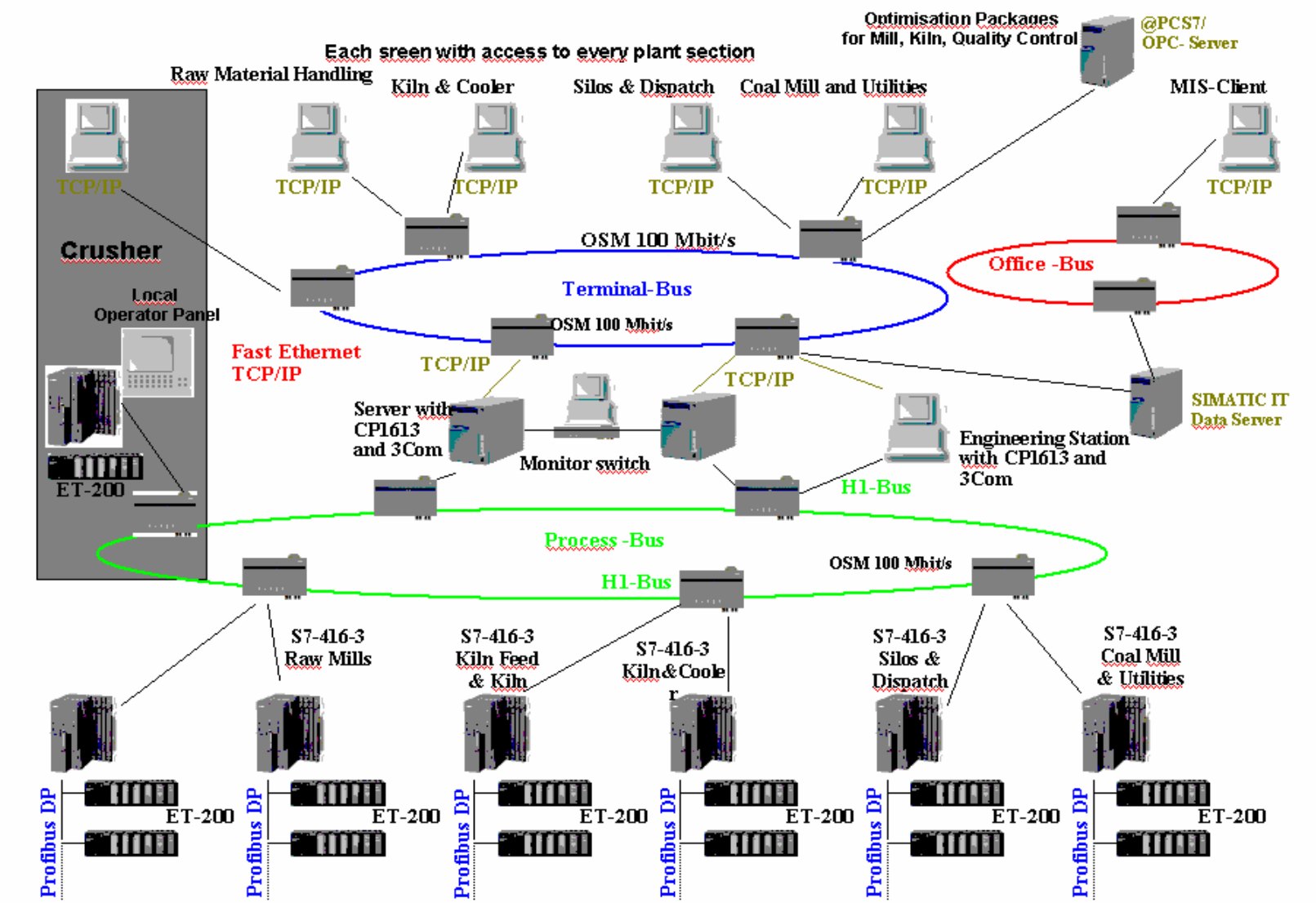
The Industrial Ethernet (SINEC H1) bus has to be installed as a ring. In case of two CP 443-1 in one PLC a CPU 417H is required.

In a control system, any PLC **can** be operated from any operator station.

The following applies to CEMAT V6:
At least 2 servers, or for smaller plants, 2 engineering stations must be installed so that the operator control and monitoring functions can be performed with the other device should one device fail. When 2 servers are used, the associated OS stations of the failed server automatically switch to the second server. Because the message server and the curve server run on these devices, the redundancy is also provided for messages and curves.

Copyright © Siemens AG. All Rights Reserved.

CEMAT Example configuration



 Copyright © Siemens AG. All Rights Reserved.

System Configuration Technical Data

System Configuration

	Typical	Maximum	*Comments*
Control systems per shared process bus	2 to 4	6	Switches can be desirable for bus loading reasons.
Operator stations per control system	6 to 8	32	OS stations to maximum 12 server/redundancy pairs.
Engineering stations per control system	2	6	At least one engineering station per plant.
AS per control system	6 to 10	20	Preconfigured
AS communications channels	2	6	
Server per control system	2 (redundant)	12	
Curve server per control system	2 (redundant)	2	Two separate curve servers (redundant) are needed when more than 5000 values are archived.

Bus Systems Technical Data

Terminal Bus System

Type designation	Industrial Ethernet	
Manufacturer	Siemens / Hirschmann	
Protocol	IEEE 802.3	
Transfer speed	10 / 100 Mbit/s	
Number of possible nodes	1024	
Maximum bus length	Up to 150 km	
Cable type		
- Coaxial	Yes	
- Optical-fiber 50/125 glass fiber	Yes	
- Miscellaneous	Industrial Twisted Pair	
Bus components	Network cards	
	3COM Intel EtherExpress	
Redundancy	Yes	**bus in ring structure**

PFK =Process Remote Component
PNK = Process Local Component

 Copyright © Siemens AG. All Rights Reserved.

Plant Bus System

Type designation	Industrial Ethernet	
Manufacturer	Siemens / Hirschmann	
Protocol	IEEE 802.3	
Transfer speed	10 / 100 Mbit/s	Fast Ethernet
Number of possible nodes	1024	
Maximum bus length	Up to 150 km	
Cable type		
- Coaxial	Yes	
- Optical-fiber 50/125 glass fiber	Yes	
- Miscellaneous	Industrial Twisted Pair	
Bus components	Network cards	
	CP443-1 for S7 400	
	CP1413, CP1613 for PCs	**with AUI/Tp and RJ 45**
Redundancy	Yes	**bus in ring structure with super vision components**

Field Bus System

Type	Profibus DP
Manufacturer	Siemens
Protocol	IEC 1158-2, EN 50170
Transfer speed	Max. 12 Mbit/s
Number of possible nodes	96 or 125 nodes
Max. bus length	2-wire: 1000 m
	Optical-fiber: up to 15 km
Cable type	
- Coaxial	No
- Optical-fiber 50/125 glass fiber	Yes
- Miscellaneous	2-wire (Profibus type)
Bus components	Optical Link Module
	Interfaces

Type	Profibus PA
Transfer speed	Siemens
Protocol	IEC 1158-2
Manufacturer	max. 31 kbit/s
Number of possible field devices	31 not Ex-area
	10 Ex-zone 1

Copyright © Siemens AG. All Rights Reserved.

Bus- Components

OSM ITP62 OPTICAL SWITCH MODULE	2 LWL PORTS 100MBIT/S, 6 ITP-PORTS 10/100MBIT/S and 8 Digital Inputs
OSM TP62 OPTICAL SWITCH MODULE	2 LWL PORTS 100MBIT/S, 6 RJ45-PORTS 10/100MBIT/S U. 8 Digital Inputs, Redundant DC24V, Alarmcontact, REDUNDANZ-MANAGER withNetworkmanagement
ITP STANDARD CABLE 9/15	INDUSTRIAL ETHERNET ITP STANDARD CABLE, witht 1X 9-POL. and 1X 15-POL. ITP-plug for ITP-END DEVICE connections on ITP-Network Components , lenght 5 m
FIBER OPTIC CABLE STANDARDCABLE	proratable preconfigured with 4 BFOC- plugs, lenght: 10 m
Industrial Ethernet Switch SCALANCE X414-3E	mit integrierten TP Ports (2 x 1 Gbit/s und 12 x 100 Mbit/s) für elektrische und/oder optische Industrial Ethernet-Netze; mit Steckplätzen für Medienmodule (1 x 1 Gbit/s, 2 x 100 Mbit/s) und Extenderschnittstelle
Medienmodul MM492-2	mit 2 Ports 1000BaseSX, 1 Gbit/s, Multimode-LWL bis 550 m, SC-Anschluss
Medienmodul MM491-2	mit 2 Ports 100BaseFX, 100 Mbit/s, Multimode-LWL bis 3 km, BFOC-Anschluss
Industrial Ethernet Switch SCALANCE X208	mit 8 RJ45-Ports

Copyright © Siemens AG. All Rights Reserved.

Device Configuration

Operator Control and Monitoring System

Type designation	Actual PC (IL40S V2)	Minimum requirements
Manufacturer	Siemens	
Processor type	Pentium IV	
CPU clock frequency	>= 2,8 GHz	
Installed RAM memory	1 GB	Server, ENG 2 GB
Harddisk mirroring	RAID Level 1	Server
Hot Swap	yes	optional
Hard disk	>= 60 GB120 GB	
Hard disk seek time	<= 8 ms	
Diskette drive required?	No	
Cache memory	512 kB	
Bus interfaces	Etherlink III 3 COM (terminal bus)	
	SIMATIC, CP1613 (process bus)	
Monitor- Keyboard		
Monitor size	19“	
- Typ	LCD	
- Manufacturer	Siemens	
- Refresh rate	97 Hz	
Number of colors	64 K	
Resolution	1280 x 1024	
Keyboard type	Standard PC keyboard	
Trackball/mouse	Yes	
External Alarm Information		
on board Soundcard	yes	
Signalmodule	yes	optional, 3 Channels
Send SMS	yes	optional
Send E-Mail	yes	optional
Visualisierungs Software		
Languages	German,english, fran., spain, ital.	
Userlevel	99 Operator	128 User
Multiwindows / Pop-up	yes	
Bar graphs		
Trend curves		
- no. of trend	8	
..- selectable time range	1 min. – 48h	
..- minimum sampling period	1 sec.	
..- movable ruler with time indicator	yes	
..- scroll back to historical trend	yes	
User interface	CEMAT V6 Based on PCS7	
Number of process pictures	No system limit	Limit HD and time

Copyright © Siemens AG. All Rights Reserved.

Number of circles	No system limit	
Number of trend pictures	No system limit	
Total number	No system limit	
Length of alarm list	Typically 8 days (parameterizable),	limited by the available memory

Copyright © Siemens AG. All Rights Reserved.

Process Stations Technical Data

Process Station		
Type designation	SIMATIC S7-400	
Manufacturer	Siemens	
Processor type	CPU 416 – 3DP / 417 / 417H	
CPU clock frequency	Instruction cycle time from 0.08 µs	
Processor loading	Max. cycle time	
Total:	200 msec	
Of which:		
- Base load :	100 ms	
- Application programs.	50 ms	
Cycle times	<= 200 ms	
- Parameterizable in steps	Yes	
- Step size?	10 ms	
Installed RAM memory	2 x 2.8 MB	
- Spare in MB	2 x 0.8 MB	
RAM, max. expansion	2 x 1.6 MB	
Load memory	min. 4 MB	
RAM battery backup		
- Type	2x Lithium AA 1.9 Ah	
- Bridging time	712 days	With PS + CPU
- Lifetime	5 Years	
Real-time clock?	Yes	
Calendar ?	Yes	
Timestamp resolution	<= 100 ms	
Where does the timestamp take place?	In the CPU	
Plant bus		
- Type:	Industrial Ethernet, Fast Ethernet	
- Protocol:	IEEE 802.3	
Field bus		
- Type:	Profibus DP EN50170	
- Protocol	IEC 1158-2	
Full-graphic documentation current program	Yes CFC function plan	
Field bus		
Profibus DP		
- Max. number / PNK:	13 loops	
- Max. nodes / bus:	96 / 125	
- Full functionality?	Yes	
- Fiber-optic between buildings.	Yes	
Other field buses:		
- Profibus DP/PA	Yes	
- Profibus FMS	Yes	
- Interbus S	No	

Copyright © Siemens AG. All Rights Reserved.

Process Station

Peripherals	
Central modules	
- Type	S7-400
- Maximum expansion	16382 byte DI 16382 byte DO 1024 byte AI 1024 byte AO
Diagnostic capability of the I/O modules	
- Except I/O module?	Yes
- Except channel?	Yes
Decentral modules	
- ET200S	
- All modules usable?	yes
- ET200M	
- All modules usable?	Yes
Analog modules	
- Type	
- Single potential separation	Yes
- 0 – 20 and 4- 20 mA	Yes
High-performance modules, manufacturer-dependent	Counter, positioning, path acquisition modules, etc.

Base data for assignment of the process station

Response times for Binary signals	
- Average	500ms
- 10% of the signals	200ms
Average amount of:	
Drivers:	300
Paths:	50
Analog inputs:	200
Setpoints:	50
Setpoint controllers:	30
DI/DO	2000/350

Copyright © Siemens AG. All Rights Reserved.

Engineering Station Technical Data

Engineering Station		
Type designation	Aktuelle PC Serie (IL 40S V2)	Minimum requirements
Manufacturer	Siemens	
Processor type	Pentium IV	
CPU clock frequency	>= 2,8 GHz	
Installed RAM memory.	2 GB	
Hard disk	>= 2x 120 GB	
Hard disk seek time	<= 8 ms	
Cache memory	512 KB	
Bus interfaces	Etherlink III 3 COM (terminal bus) SIMATIC, CP1613 (process bus)	
Monitor size	19“	
- Manufacturer	Siemens	
- Refresh time**.**	97 Hz	
Number of colors	64 K	
Resolution	1280 x 1024	
Keyboard type	Standard PC keyboard	
Trackball/mouse	Yes	
Diskette drive required?	No	
CD RW	Yes	
System engineering	Separate description	
Programming languages		
- CFC	Yes	
- SFC	Yes	
- SCL ST structured high-level language	Yes	
Object-oriented operation	Yes	
Module libraries	Base functions PCS7 Technological modules CEMAT V6	
Connection capabilities for:		
- OLE, DDE	Yes	
- ODBC	Yes	
- API	Yes	
PFK pictures and variable change on the ES and reload online	Yes	
Online change behavior – Simple logic:	Perform PNK – change on the ES and reload online	

PFK = Process Remote Component
PNK = Process Local Component

Copyright © Siemens AG. All Rights Reserved.

Volume of Project Data

	Typical	Maximum	Comments
Communication / control system			
Process objects	5500	13 000	(drives ,counter and measured values)
Events (message bits)			Depending on the number of objects
Number of AS on The IE (SINEC H1)	8	20	
Telegrams per second	10	approx. 15	
Acquisition cycles for measured valued (concurrently)	10%/sec. 90% > 5sec.		10 % curves with 1s 90 % curves with 5 s / 10 s
Updating cycle in the picture	< 1 s	1 - 2 s	
Pictures			
Number of pictures	120	Unlimited -	
Number of controls (stat. and dyn.) per picture	250	approx. 800	
Picture level	3	32	
Picture size in pixel	1280x1024	4096x4096	
Drive functions			
- per control system - per AS	2400 300	6000 400	Distributed over several servers
Measured value			
- per control system - per AS	1600 200	4000 300	Distributed over several servers
Quantity values (counters (CNT), runtimes (RT))			
- per control system - per AS	800 100	3000 250	Distributed over several servers
Controllers			
- per control system - per AS	120 15	400 35	Distributed over several servers
- Short trend			
- per control system	500	2000	Distributed over several servers
Trend curves (OS)			
- per control system	1000	5000	Typical distribution: 10% with 1 sec. archiving cycle 40% with 5 sec. archiving cycle 50% with 10 sec. archiving cycle
Userrarchiv			
-Anzahl Archive		Unlimited	
Archive fields		500	The product from no. of fields and Data Records
Data records		3000	Must not exceed the value 320000
Archive view		Unlimited	

Copyright © Siemens AG. All Rights Reserved.

	Typical	Maximum	*Comments*
Curves			
Number of curve frames per graphics picture	2	25	
Number of curves per curve frame	6	80	
Number of curves per picture	12	80	
Archives per Server/ Single Station	20	100	
Archiving Values	2000	30000	Archivserver necessary
Number of measured values per measuring points on HD		All	Depends on the acquisition cycle, for recording longer than 1 week
Number of measured values per measuring point in main memory	30	Time duration 10 minutes	Depends on the acquisition cycle
Archiving in database	200 values/sec.	5000 values/sec.	10000 values/sec. with Archivserver
Logs			
Number of logging printers	1	3	
Message sequence logs (active)	No	yes	
Number of message archive logs	3	5	
Number of log lines per message	3	3	
Number of variables in the log element	2	2	
Recipes	25 to 50	Unlimited	Limits set by running times
Alarms / messages			
Configurable massages per server	20000	50000	Object dependent
Message classes	10	18	
Message types		16	
Message priorities	2	17	
Process tags per message line	1	10	
User text blocks per message line	4	10	
Number of message archives	1	1	
Number of current message archives	1000	2000	
Number of long-term message archives	8 days	30 days	
Message burst without message loss	10/sec.	100/sec.	
Messages permanent	20/h	10/ sec.	

Note: Some of the maximum values are significantly larger than the typical values and can normally be "approached" when other requirements are reduced. The typical values apply in combination and have been tested in this form.

Copyright © Siemens AG. All Rights Reserved.

System Performance CEMAT V6

The times listed here have been measured in a test. Note that some of the test pictures used here have a complexity that is seldom reached in practice:
Test conditionen:

- OS Stations with PDL-Cache
- Network Hardware CP1613, CP443-1 / 100Mbit , OMS
- cyclic service activ

	Typical	Maximum	Comments
Picture selection time			Incl. initial update of the picture without additional background loading
Picture with purely static content	< 1 s	1 s	
Picture with 140 controls, 100 bitmaps	< 1 s	2 s	
Picture with 240 controls	2 s	4 s	
Picture with 70 digital and 2 curve displays each with 6 curves	3 s	5 s	
Dialog selection in the process picture	< 1 sec	1 sec	
Variable updating	1 sec	2 sec	Process event -> screen
Operator response	1 sec	2 sec	Operation and confirmation
AS response time			
AS response time S5	300 msec	800 msec	1 cycle
AS response time S7	100 msec	300 msec	1 cycle
Curve output			
Output/selection trend archive	2 sec	2 sec	6 curves
Output/selection long-term archive	10 sec		Max. value depends on the selection criterion
Output/selection message archive	3 sec	30 sec.	Max. value depends on the selection criterion
Establish protocol	10 sec	60 sec.	Max. value depends on the log type and interval

Copyright © Siemens AG. All Rights Reserved.

Memory Requirement

	Typical	Maximum	Comments
Pictures			
Storage capacity on HD	600 kB	> 4000kB	
Measured value archive			
Hard disc space			
- TagLogging Slow		32byte	
- TagLogging Fast		3byte	with 10-times compression
Message			
Hard disc space RT			
- Message without accompanying values and comments		172 byte	with 10-times compression
- Message with max. amount of accompanying values and comments		4012 byte	

Copyright © Siemens AG. All Rights Reserved.